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THE WEAPONS, WARRIORS AND WARFARE OF NORTHERN BRITAIN, c. 1250 BC – 850 AD

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Declaration

I confirm that the following thesis has been composed by me, and is completely my own work. None of the information has been submitted for any other degree or professional qualification. None of the information has been submitted for publication.

Kate Anderson 9th September 2011

This study is dedicated to my family, and particularly to the memory of my grandmothers.

“Stick them with the pointy end”

George R.R. Martin

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Abstract

This thesis focuses upon the material culture associated with warfare, conflict and inter-personal violence in northern Britain during the Late Bronze Age, Iron Age and Early Historic Period. Its aims are to understand the evolving role of warfare in society, who were the individuals engaging in conflict, what weapons were being used, and how were they being used. Although previous studies have touched on some of these topics, the material of northern Britain is frequently overlooked in favour of southern British data, and none consider the development of the topic over several time periods.

Contextual data was collected on all the extant swords, spears and shields within the parameters, while a significant proportion were fully examined to enable more complex analysis. Evident opportunities and weaknesses within the resulting database were addressed and exploited, applying experimental archaeology to the bronze spearheads to investigate use patterns, and typological theory to the iron spearheads to enable meaningful inclusion. A range of additional sources of information, including iconographic, textual and osteological, were synthesised to facilitate a discussion of the life-cycles of the extant weapons themselves, and to address occasions when a gap appears in the archaeological record – as occurs during the Early Historic Period, where weaponry is almost absent, but other forms of evidence regularly reference conflict.

Two particular conclusions of this thesis challenge traditional perceptions of both weapons and warriors; spears are found to be complex, both in use and social symbolism, rather than simplistic and low-status, and their integration into general discussions of weapons and warfare is a matter of urgency if the topic is to progress. The typological groupings of iron spearheads presented here is intended as a first step towards greater inclusion. The identity of combatants is also shown to be occasionally at odds with the traditional perception of the warrior, wherein reality and idealised social constructions diverge. This is not necessarily problematic, with the projection of warrior identities shown to be a deliberate

choice, rather than a reflection of reality, the constraints and motivations behind such choices a fascinating topic for further work. Finally, the development of armed social conflict in northern Britain over two millenia, and the changing relationships and dominance between religion, display, consumption, social hierarchy and warfare, are presented through the manufacture, use, deposition and associations of the weapons in the database.

[Please note that elements of chapters 4 and 6, have previously been published in the journals Cosmos and Antiquity. The former paper is available in full in Appendix 5, while the latter is available http://antiquity.ac.uk/ant/085/328/default.htm]

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Chapter 1: Introduction

“Violence ... is a near-inevitable outcome of the dynamics of self-interested, rational social organisms” (Pinker, 2002: 329).

“The aim of the archaeologist should not simply be to identify warfare in the archaeological record, we can assume that warfare is present. The archaeologist should instead understand the nature of warfare and the manner in which it influenced the changes in society” (Sharples, 1991: 80)

1.1 Introduction

One of the striking things about many archaeological studies on the topic of warfare is that although very few scholars doubt the existence of conflict itself, there is a general reluctance to accept weapons, edge damage, fortified sites and so on as evidence of warfare taking place. They are considered to reference warfare but considerable efforts can be made to emphasise that they are not direct proof of it; the only exception is osteological evidence. Although technically correct, there is an element of reversing the concept of 'hearing hooves and seeing zebras'. The burden of proof for warfare appears to be considerably higher than for other aspects of life, and the question is why? There may be anthropological reasons for wishing to pacify the past (see chapter 2), but it may also relate to the way we think and speak about conflict; definitions of what is meant by the words 'warfare', 'violence' and 'conflict' are important, indicating a range of human behaviours whose presentation, effects and evidence are quite different.

As will be demonstrated below, most definitions of 'warfare' are either so specific that they become overly restrictive, or are made flexible enough to permit a nuanced approach, but in doing so lose meaning. However, although definitions, in the form of a short sentence or two, may be unhelpful in a research volume, it is critical that the concept of 'warfare' as it is understood by the author is made explicit, in order to adequately inform the reader on the parameters of the work. In this case, the challenge was to consider which forms of violence are relevant for

study and which are not.

Not all the key texts relating to the study of warfare feel the need to precisely define the word, perhaps because it is felt that the meaning is obvious, that the meaning will become clear as the text is read or because it was felt that the concept is too fluid to be defined effectively. However, here it is useful to consider possible definitions in order to focus on what aspects are, and are not, of interest. The Oxford English Dictionary (2006: 864) definition is: "The activities involved in fighting a war" – which is clearly far too general and unspecific to provide much interest here. Thorpe & Parker-Pearson (2005: 2) go into more detail:

"Organised aggression between autonomous political units, and thus of wider significance than individual acts of violence"

In this case, there is a clear rejection of disorganized, random and individual acts of violence, thereby including only those conflicts sanctioned by society as a whole; however, while it is clearly of interest to distinguish between violence at the community-wide level and interpersonal level, there are two problems here. The first is that it is in most cases impossible to distinguish which type of violence is responsible for the evidence in the archaeological record. Secondly, the requirement for 'autonomous political units' makes assumptions regarding the level and style of social organization involved which may not apply to all societies that might otherwise be described as participating in warfare. Finally, it implies a case of 'either/or', despite the most studies suggesting a *scale* of sanctioned violence. This ranges from the 'total war' scenario (considered as the desire of one group to utterly destroy another, employing few rules on the battlefield, killing civilians and destroying the ability of the opposing group to sustain life), through economics-driven raiding and spontaneous inter-group skirmishing, to individuals involving themselves in entirely autonomous conflicts (Molloy, 2006: 41). Two styles of engagement which are not always considered in such studies, but which do fit within the scale and are relevant here are highly ritualised combat behaviours and single combat. Although both types of combat are possibly an attempt to limit loss of life, motivations may be more complex in that such

combats would have provided a forum for both displays of wealth and power (in terms of individuals with very specialized training and prestigious weaponry) and for power struggles *within* particular elites (Molly, 2006; Kristiansen & Larsson, 2005).

The forms of violence that are often excluded (be they domestic, judicial or inter-personal) are rejected because they are not connected to the essence of warfare, which revolves around conflict between polities; they relate to internal, not external, conflicts. However, it is perhaps disingenuous to suggest that these forms of violence are not un-related to each other, particularly in the lived experience of the participants. Osteological evidence is usually presented as the only direct form of evidence of conflict (Hunter, forthcoming), while the presence of weapons, hillforts and iconography are said to only *reference* warfare – as Armit (2003: 114) notes, "the problem is that actual military strength and symbolic military strength may end up looking rather similar to the archaeologist". However, the argument made here is that such reference also acted as a threat to those who saw it; a worn sword conveys the message not just that the bearer might be a warrior, but also that the sword could be used to hurt them if the social transactions being engaged in go badly. A well-defended hillfort might be created as an expression of wealth and power, but also conveys that any attempt to take it by force will end in failure. Therefore, the question is whether the threat of violence (and its accompanying evidence) should be as valid a topic of study as the violence itself? Certainly, such an approach dramatically widens the evidence available for study, while also avoiding some of the practical issues that have effectively limited previous studies. Foremost of these, which is certainly an issue for Thorpe & Parker-Pearson's (2005: 2) definition, is that it is impossible to distinguish between types of violence in the archaeological record (as it is also difficult to determine the motivations for violence). This has proved to be an intractable problem for most studies, and such an impossible task has not been attempted as a core objective here. During the following chapters, such determinations are made where possible, but are not given undue prominence.

Warfare and individual acts of violence committed with weapons are not

unconnected. The aggressor may use a weapon created for war, employed the training and experience undertaken for war and possibly their behaviour in this instance may be informed by their role in sanctioned violence – their behaviour in engaging in any form of violence will therefore be informed by their own personal experience of, and societal attitudes to, conflict. Furthermore, physical violence itself forms only a small part of the range of behaviours involved in the domination of one group or individual by another, while warfare itself is only a part of physical violence. Too close a focus on warfare removes attention from other significant variations. Consequently, this thesis concerns itself with all scales and forms of violence and conflict, and all the evidence that may relate to that, on the basis of their interconnectedness.

The reasoning on a focus on violence and conflict is relatively simple. The image and roles of the warrior and warfare are deeply embedded in modern perceptions of Britain's prehistory, but are frequently portrayed simplistically and unproblematically. Assumptions abound unquestioned and this thesis seeks to challenge some of the most persistent of these. Furthermore, the majority of works published on the topic are restricted to one time period, thereby failing to consider both the liminal periods of transition and the overall development of this aspect of society over a longer period; again, a gap that this thesis seeks to begin to rectify. Finally, northern Britain is under-represented in published material in relation to the south; the reasons for this may well lie in the relative quantity and preservation of the evidence, but there remains considerable scope for further work in, and understanding of, this area.

1.2 Objectives and structure of this study

There are three main questions that this work seeks to address:

1) What role did warfare play in society?
2) Who were the people who engaged in warfare?
3) What weapons were used in fighting and how were they being used?

To this end, a database was collated of the extant offensive and defensive weapons of northern Britain to determine how best these questions might be answered. That

database proved instructive in itself, as four key elements arose from its examination: the preservation of the bronze material was sufficient that specific types of edge damage were still visible; the iron spearheads were an as-yet unexamined and undifferentiated mass of material which, without some initial typological work, could not be meaningfully included in any further analysis; weapons from the Early Historic Period were almost entirely absent; the volume of data collected would enable consideration of a range of issues relating to the creation, use and deposition of the weapons. Consequently, this work follows an unusually heterogenous approach, in that rather than solely focusing on a single aspect of the material, such as edge wear, typological series or iconography, the focus is guided by the nature of the data. This is a practical response to the relatively unusual approach of examining more than one time period – as each will inevitably present different types of evidence and problems, so a more varied approach is required.

The response to the key aspects of the data led to the core chapters of this study. Two chapters present the literature review, methodology of data collection and analysis, and the background research on (and nature of) the weapons contained in the database. Following this are chapters on experimental work with bronze weapons detailing their use in combat situations; typological analysis of the population of iron spearheads; the level of analysis that can be achieved using indirect sources when, as with the EHP material, the primary evidence is absent; and finally, a chapter discussing the life-cycles of the bronze and iron weapons. Each seeks to answer some aspect of each of the original research questions, before the threads of each are drawn together in chapter 8 to present a proposed model for warfare in society in northern Britain. Finally, the concluding chapter seeks to assess the level of success in answering the objectives stated above.

1.3 Parameters

Prior to further discussions, the research parameters employed during the course of this study, and the reasons for them, must be made clear.

1.3.1 Chronological

A crucial aspect of this study is the opportunity to examine the 'how', 'when' and 'why' of insular developments in material culture over a long time period, when it is possible to discount the effect of mass invasion, occupation or foreign rule. The time periods covered by this study include the Late Bronze Age (LBA), Iron Age (IA) and the Early Historic Period (EHP).

The start date of the LBA tends to vary slightly depending on the publication, but this work will conform to Bridgford's (2000) date of 1,250 BC, a date which is given credence by the results of her study. Although there is a liminal period between the LBA and IA in terms of material culture, the accepted date for the start of the IA is 750 BC. These discrete dates for the start and end of chronological periods are useful in terms of setting the parameters of analysis and research, but they have the unfortunate psychological side-effect of implying an immediate and straightforward transition. Perhaps as a result, a common feature of the vast majority of published works relevant to this thesis are that they deal exclusively with one chronological period or another; rarely do any consider two or more periods, and even more rarely are the liminal, transitional stages between periods given detailed consideration. An exception is the volume edited by Haselgrove & Pope (2007), and particularly the Needham paper within that publication, which deal with the most important period of change relating to material culture dealt with in this work – the LBA to IA transition. The papers contained in that volume indicate that it is not enough simply to know that the materials of war have changed: it is necessary to address, if only briefly, how and why that transition occurred and what effects it had other than a purely materialistic one. Such an understanding will provide a broader platform of understanding from which to consider the issues raised in this work.

During the BA, bronze had a plethora of social roles outwith the merely functional; it was integral to the religious, political, structural and social lives of BA peoples, who were consequently heavily dependent on it (Needham, 2007: 54). In understanding the transition to the IA, one must also understand the importance of the social superstructure that changed, how that happened, why it happened and what it was eventually replaced with. Needham (2007: 49) proposes three

hypotheses to explain how the reduction in the primacy of bronze might have come about:

1. The transition was slow and steady, involving the development of ironworking during a long period of diminishing bronze use
2. Bronze was quickly undermined by iron, with the possible novelty of the latter propelling it to become the 'socially acceptable' metal
3. A crisis in bronze production was followed by a period of generally low-intensity metal use in which iron replaced bronze as the dominant material

These are not entirely mutually exclusive and it is quite possible that elements of each hypothesis were present in the process of the bronze collapse, the trigger for which has been the topic of intense debate. An early explanation involved a utilitarian and conflict-centred approach; that iron weapons were technologically superior to bronze weapons, which led to bronze losing status and becoming entirely replaced with iron (Needham, 2007: 54). Such an explanation has long since been discredited, partly in recognition of the complexities of the record itself in terms of changing rates and modes of metal consumption and deposition, and partly because it is possible that contemporary bronze and iron weapons were equally effective. Informal combat experiments testing bronze and iron weapons against each other suggest that the use of iron did not provide a noticeable advantage (Neil Burridge, pers. comm.). The Vickers hardness values of LBA swords suggested in chapter 4 are somewhat lower than those indicated for some of the IA swords (from both north and south) (Tylecote, 1986: 149-150; Lang, 2006: 90-109), but those IA swords that have been tested date to no earlier than 200 BC, when techniques of using multiple alloys, carbonising and quenching during the manufacturing process were developed. Lang (2006: 113) notes that these were a “technical advance”, and it might be expected that any swords made contemporarily with bronze ones would be less technically accomplished and without any advantage in hardness. Another trigger which may be discounted is economics, such as a period of severely limited supply; Thomas (1997), Bradley (1997) and Haselgrove & Pope (2007) concur that the transition was a social issue – a response to changing ideology and practice. Haselgrove & Pope (2007: 6) go on to suggest that when the social value system based on bronze began to decay, the result was an increasingly rapid deposition of the devaluing metal.

At this stage it is not appropriate, however tempting, to interpret the development of iron working as a substitution for bronze. It is not the case that iron simply 'took over' from bronze, since their social roles were very different. As the vestiges of the 'prestige goods' system disappeared into watery deposits and hoards, new methods of social expression and value systems were implemented, apparently based on control of land and agricultural production (Thomas, 1997). Needham (2007: 55) posits that if some of the social roles of bronze did transfer to other material objects, then it would have been ceramics that took the place of bronze; iron may have fulfilled the same utilitarian functions, in a reduced capacity, but was not immediately imbued with the same innate status and prestige.

The change in the status of bronze is perhaps one of the causes for the key indication that the BA/IA transition has taken place – the end of the practice of depositing not just weapons but almost all metalwork, and the consequent inequalities in the consumption of metalwork in the LBA and EIA. Additionally, while many studies have noted the comparative difference in levels of corrosion and recognition potential between bronze and iron, and the effect on the amounts of each found, significantly larger quantities of LBA metalwork appear to enter the record at a period when communities were keen to build up their emerging stocks of iron (Needham, 2007: 59). Intensive recycling of ironwork is likely to have taken place and very little would have entered the record. Therefore, not only is it possible that a reason for the deposition of large hoards of bronze was the disposal of material of declining prestige, but it is also possible that hoards did not continue with a primarily ferrous content as a result of the intensive recycling and stockpiling that occurred at the start of the IA.

The end of the IA in northern Britain is debatable, as the Roman presence in northern Britain was in many areas limited, discontinuous and of a variable nature. Consequently, the period of the Roman presence in Britain between AD 43 and AD 410 has not been treated here as a distinguishable period from the IA. Instead, it is viewed as a period when Roman material culture was, to differing degrees depending on area, most likely to have had an influence on insular material culture,

rather than forcing substantial changes upon it. Therefore, for the purposes of this study the duration of the IA is 750 BC until AD 410. However, that constitutes a duration that is clearly too extended to comfortably treat as homogenous and the weapons evidence suggests a division into two distinct periods: between 750 and 200 BC deposition of metalwork is extremely rare and securely dated weaponry is non-existent from this period, which is described here as the Early Iron Age (EIA). After 200 BC, the deliberate deposition of metalwork becomes increasingly frequent, and so the period between 200 BC and AD 410 is here termed the Later Iron Age (LIA).

Following the Romans' withdrawal from Britain there is a period characterized by formation of independent, documented territories and insular aggression (Fraser, 2009); although occasionally described as the 'long Iron Age', the changes in social structures, religion and sources of evidence during this period set it apart from the IA, and it is thus termed the Early Historic Period (EHP) during this thesis. Occasions when external aggression focused on northern Britain, such as the Norse raiding of west of Scotland monasteries, again did not have large scale impact on the local material culture. This started to change at the beginning of the 9th century AD, when widespread Scandinavian settlement began to significantly alter the linguistic and ethnic character of parts of northern Britain (Alcock, 2003: 4). The increasing suppression of Pictish identity at this time, followed by the formalised and permanent union of Dal Riata and Pictland around AD 850, suggest that AD 850 is therefore a suitable date for the end of the EHP.

1.3.2 Geographical

This study looks at material found in mainland Northern Britain, which here means Scotland and northern England as far south as the River Dee in the West and the River Humber in the East. These parameters have been chosen deliberately for geographical and historical reasons, as well as in consideration of previous work.

Firstly, the spine of the Pennine mountain range that runs down the centre of northern Britain ends almost exactly between the Dee and Humber. The

geographical division of mountainous northern Britain and the more low-lying southern Britain is likely to cause a regional divide in material culture at any point in prehistory.

Secondly, there is a distinct divide between northern and southern Britain in roughly this area visible both in the archaeological record and (where relevant) historical sources of each time period relevant to this study. Bridgford (2000) states that the LBA weapons of Britain can be divided into four regionally distinct areas, based on Colquhoun & Burgess (1988) earlier work, one of which contains Scotland and England east of the Pennines (the area west of the Pennines is grouped with Wales). During the IA, Harding (2004) notes a divide between the coin-using southern areas of England and the societies to the north of the Trent that do not use coins, while Cunliffe's (1991) north western and north eastern zones roughly correspond to the area of this study. His reasoning behind the zonal division is based on geography, land potential, microclimate and contact with the continent, and seem to hold good for the majority of the IA. Roman records indicate the area just north of the River Dee as Brigantian territory; a client kingdom not directly under Roman control and a buffer between southern Roman Britain and the (mostly) autonomous areas to the north (Fraser, 2009: 23). Finally, during the EHP, the Tees appears to have constituted the southern-most boundary of the Anglian kingdom of Bernicia which stretched as far north as the Firth of Forth (Alcock, 2003: 3). Although the divide between north and south tends to vary slightly between the time periods under discussion, the Dee-Humber gap is the most logical for the purposes of this study.

Within northern Britain, the geography and zoning undertaken by Cunliffe (1991), Bridgford (2000), Harding (2004) and others, suggest the division of the entire area into 6 regions, for the purpose of identifying regional differences (see Fig. 1). While regional differences do not feature strongly throughout this study, in part due to a lack of material from various regions in various periods, such division has proved useful to an extent, and is consistent with previous approaches.

In keeping with the practice of both Harding (2004) and Alcock (2003), the

Orkney and Shetland Isles have been excluded from the area under discussion. It is not possible to know the arrangements of culture and power in relation to warfare during the LBA and IA on Orkney and Shetland, as there are not enough weapon finds from these periods to detect either similarities with, or distinct chronologies from, the mainland. However, records from the Early Historic Period (EHP) indicate that by this time the Orkney and Shetland islands were ruled by Norse incomers. The result was a rich material culture that is largely distinct from that of the mainland (Alcock, 2003: 4) and is therefore exempt from this study on the grounds that its culture is not the result of insular development.

1.3.3 Relevant sources of evidence

In examining warfare and its place in society, the obvious group of artefacts to focus upon is the weapons panoply, which includes *offensive* weapons (swords and spearheads) and *defensive* weapons (shields and armour). The proportions of each type vary greatly depending on the period; far more offensive weapons are found from most periods, while only a few examples of defensive weapons survive from each period, if at all (see chapter 3). Although offensive weapons can be made out of a range of materials such as bone and stone, the focus of this work is entirely on those native weapons manufactured of metal.

Several types of potential weapons have been excluded from the analysis. Arrows and slingshots are not included in the database for two reasons, one practical and one conceptual. Firstly, there are no known slingshots, and only a total of 10 suggested arrowheads or crossbow bolts from northern Britain said to date to the periods under discussion. The second reason is due to the hypothesis, fully discussed in Chapter 7, that aerial weapons lacked warrior status in northern Britain, and that there was also the possibility of a proscription on killing at a distance. The second group to be excluded are axes and knives, both of which have been excluded for the same reasons. Although swords, spears, shields, and sometimes armour, were present across Britain and the continent, through many time periods, as the weapons panoply of the warrior, axes and knives were generally not. They are multifunctional tools; context and edge wear analysis indicate woodworking usage for some LBA axes, while knives are the

quintessential general tool (Burgess, 1968: 7-22; Bridgford, 2000: 31; Dolfini, 2009). That is not to suggest that they do not make very good weapons when necessary (and in some cultures, such as the Norse and Vikings, axes were positively preferred [Siddorn, 2000]), or that axes in particular were not of symbolic and votive value. Whether they were pressed into service when combat became necessary is not the issue – they cannot definitively be said to have been conceived, manufactured and obtained as weapons for combat, and so cannot reliably be informative on the topics under discussion.

The contradiction in this rationale of weapon types to be studied and weapon types to be excluded is the spear. As with axes and knives, these are also multifunctional; they can be used in warfare, hunting and as defence against wild animals, and in some cases the same spear could be used for all three. The difference between the spear and the axe or knife is that there are distinguishable forms that lend themselves to various forms of combat – some *have* been conceived, manufactured and obtained as weapons for combat or combat-related display. Further, spears are routinely found in weapons hoards and warrior burials, while what literary and iconographic sources are available explicitly portray spears as a warriors weapon.

Swords may be used as items of display or as votive offerings, but in purely utilitarian terms there is little ambiguity regarding their use. As tools, they are designed to be used in combat with an opponent and would be impractical for alternative domestic uses, such as chopping wood or hunting. Similarly, shields and armour have their sole use in times of violent conflict and so their inclusion in a study of the material culture of warfare is unproblematic. However, only whole swords or blade fragments have been included in the analysis, rather than hilt or scabbard fittings, on the basis that not only are such objects unable to provide much of the crucial data required here, but also that a fitting does not necessarily equate to a sword. In contrast, shield fittings from the IA have been included as evidence of a shield because the main body of shields, made from organic material, cannot be expected to have survived. They are unlikely to provide much, if any, intrinsic data, but their extrinsic data (such as find context and associations)

may prove valuable.

Chapter 2: Literature Review and Methodology

The aim of this chapter is to summarise the key published works on the topics discussed in this thesis, before discussing the methodology behind the collection of the database of weapons – the research tool which informs the remainder of this work. Both anthropological and archaeological approaches to the study of warfare are important in attaining a balanced conception of this topic, and the development of both is considered here. Although specific typologies of weapons types are considered in Chapter 5, this chapter contains a more general discussion of the key catalogues and typological developments from which much of the data and classificatory systems for the database were drawn. Similarly, the development of experimental archaeology relating to weapons and their combat use is discussed in detail in Chapter 4, but a broader treatment of the development of experimental archaeology is outlined here. Finally, the methodology with which the material in the database was compiled, examined and categorised is made explicit.

2.1 Approaches to Warfare

2.1.1 Anthropological approaches to the topic of warfare

Many of the most respected works relevant to this topic are anthropologically based general texts, rather than archaeological studies of warfare in prehistory, a bias that Thorpe & Parker-Pearson (2005: 2) attribute to a caution in archaeologists engendered by the "excesses of past interpretations". The majority of these were written by American anthropologists, and are generally constitute objective, framework-heavy thinking, mainly focusing on the causes (Innate vs. Marxist approaches) and effects (ecological and sociological) of warfare.

Much of the earliest thinking on the causes of warfare among humans was heavily

influenced by evolutionary psychology, assuming that violence and conflict is inherent to the nature of humans. Thorpe & Parker-Pearson (2005:3) list the three main theories on the root cause of violence as relating to territory/resources, reproduction and status competition. However, as they point out, humans create good, as well as bad, relations with neighbours, as circumstances allow. Further, much of the work on territorial issues was based on research into chimpanzee behaviour (which may have been unrepresentative in any case, due to the stress they were under), as was the work on reproductive conflict, and is certainly not necessarily an accurate reflection of human behaviour and motivation. Status does seem to play a role in the creation of warrior elites in society, but given the well-documented alternative possible methods to gain prestige within society, such as wealth display, this seems an unlikely sole cause of human warfare.

However, during the 1970s and 1980s British archaeologists demonstrated an unwillingness to consider the topic of warfare in any detail (Armit, 2011: 503), and by the 1990s, Keeley (1996) felt that the behaviour as determined by genetic traits approach had swung so far in the opposite direction that he publicly criticised a number of archaeologists for 'pacifying' the past through their interpretation of sites and artefacts. Specifically, he cited Fagan's (1989) interpretation of Neolithic enclosures as entirely peaceful, Whittle's (1985) interpretation of ditches and ramparts as solely expressions of exclusion, and the general trend away from terming burials with associated weapons 'warrior burials'. The main thrust of Keeley's criticism is that these interpretations ignore key pieces of evidence, presumably because the archaeologists making them believe in the inherently pacifistic nature of humans. While it is true that the individuals Keeley cites do seem to draw perversely unbalanced conclusions from their evidence, Thorpe & Parker-Pearson (2005: 1) argue that it is not at all clear that any 'pacification of the past' took place in Europe in the latter half of the 20th Century, as the BA and IA have always been considered 'warrior ages'.

By the late 1990s, theories on genetic pre-determination had given way to rather more nuanced views on the causes of warfare. Early on, Keegan (1993) noted the possibility that warfare in a society might start out as a cultural phenomenon that

becomes habitual, his implication apparently being that the behaviour becomes so entrenched it is perhaps not the responsibility of the individual. Subsequent writers lessened the emphasis on collective responsibility, Carman (1997a: 3) noting that since humans are capable of both violent and peaceful behaviour, the *chosen* behaviour will depend on "specific, culturally prescribed circumstances" and Thorpe & Parker-Pearson (2005: 5) make the rather obvious point that war may well be undertaken solely when it is of material benefit to the combatants. Both of these motivations emphasise the ability of the participants to make choices, to be the instigators of their own futures rather than the victims of their biology or cultural pressures. What is interesting is that several of the contributors to the Carman & Harding (1999) volume actively and explicitly try to distinguish the activity of war from the rest of the social experience, dividing their source material into weapons *or* tools, defensive *or* symbolic monuments. Therefore, the approach that seems to be emerging is one that allows autonomy for the individuals to make the choice to become involved in warfare, while those same activities are seen as somehow separate and alien to the normal activities of society. The former point is one agreed with here to an extent, although Keegan's view, that social pressures plays a large part in the decision of individuals to participate in warfare, is also extremely important. Much of the evidence in this thesis points to the prestige attached to the role of the warrior in society during many periods, making it an obvious and attractive choice for many individuals, yet still a choice. The latter point is one that runs entirely contrary to one of the main concepts that underpin this thesis – that warfare is an integral and key component in society, allowing it to function in a desired manner. It is the aim of this study to show that the material evidence associated with warfare is often the same as, or connected to, that relating to 'everyday life'.

2.1.2 Archaeological approaches to the topic of warfare

The examination of material evidence is one of the approaches that sets an archaeologist apart from a historian while the consideration of context of the material evidence is what sets the modern archaeologist apart from the antiquarian or metal detectorist – in the words of Hodder (1986: 120) "to reaffirm the

importance of context thus includes reaffirming the importance of archaeology as archaeology". Thus it is unsurprising that archaeological studies on the topic of warfare tend to take either a materialistic or contextual approach.

Archaeological authors of the 1980s, such Mercer (1989), have drawn on anthropological sources and approaches to develop materialist models for warfare applicable only to specific societies, which focus on the levels of violence, scales of warfare and the causes of potential conflict, essentially looking at the practical and functional effect of warfare on society. Carman (1997b) argues that such an approach is problematic since the material evidence – in this case, weapons and iconography – is therefore viewed through an anthropological prism, masking the benefits of an entirely archaeological approach.

However, by the 1990s, there were arguments that archaeologists were ignoring the experienced reality of warfare in favour of theory driven, framework-heavy studies. Keegan (1993), himself a military historian, began to fully engage with the subject matter and write about military encounters from the point of view of the individuals concerned, moving away from an earlier squeamishness in dealing with the reality of conflict. This 'nuts and bolts' approach to the topic led to a whole range of studies re-examining the relevant material to determine whether the evidence actually demonstrates proof of violence, rather than simply its possibility. The last fifteen years have also seen a move towards placing warfare in as broad a social context as possible (Carman, 1997a and 1997b), in addition to considerable experimental work to shed light on the experience of making and using weapons in a realistic context (Bridgford, 2000; Davis, 2006; Molloy, 2006).

This thesis draws on these latest approaches, focusing on experimental work to determine the most likely modes of use of certain weapons, in addition to attempting to prove that, rather than existing as a negative, abnormal aspect of human behaviour, warfare instead plays an integral, normalized role in society, allowing it to function in specified ways.

2.2 Topical Studies

2.2.1 LBA northern British material studies

Taken together, the works of a variety of authors provide a wide range of studies on the weapons panoply of the LBA in northern Britain, although the majority discuss Britain as a whole and the northern British material must be drawn from within that wider group. In terms of swords, Colquhoun and Burgess (1988) produced a catalogue that is still the most referenced work on the subject today, providing a comprehensive typology, and chronology, for swords found across Britain. More recent work has been undertaken by Bridgford (2000), examining metallographic and edge wear patterns, and Molloy (2006), who focused on experimental work in connection with combat damage. The spearheads have been studied by a range of authors (Greenwell & Brewis, 1909; Coles, 1960; Ehrenberg, 1977; Davis, 2006), who have mainly worked on typological classifications for the material. Relatively little work has been done on LBA shields, and what there is concerns Britain as a whole – the seminal work in this area was undertaken by Coles in 1962, who was mainly concerned with their functional use but also identified some basic typological classes. Molloy (2006) built on the issue of functionality of the shields in his thesis, questioning Coles' original, and widely accepted, interpretations.

The typology of swords created by Colquhoun & Burgess (1988) has proved to be robust, comprehensive and functional, in that all extant examples fall into one of the categories they identified, the chronology integrates well with other evidence and there have been no subsequent substantial revisions or amendments to their work. Although the catalogue covered all the swords of Britain, of the 36 types and variants identified, only 20 are to be found in northern Britain. These range from the Rosnoen type (1,300BC – 1,200BC) to the Gündlingen variants (800BC – 600BC), each of which is classified according to its morphology, shape of the blade and aspects of the hilt being the most important features. Unfortunately, while the catalogue is comprehensive and helpfully provides information on the current whereabouts of many of the artefacts, it pays scant attention to the importance of the context and associations of the swords, both of which are crucial to the analyses of this study (see Chapter 7).

In contrast, Bridgford and Molloy focus less on categorization, with Bridgford tackling quality issues in production and edge wear analyses while Molloy takes a directly practical approach to the topic of use and functionality, firmly following the recent 'conflict as an experienced reality' trend. Bridgford's thesis does provide an invaluable resource to the researcher – she identifies and labels six diagnostic forms of combat damage which can be used as a guide when examining weapons. However, again there are two distinct methodological problems with the work. The first is one of omission; although the LBA spearheads are discussed in a typological context, Bridgford does not examine their levels of edge damage as she does for the swords, in what I believe to be the mistaken belief that spears were only used as throwing or thrusting weapons. The second issue relates to the methodology of her experimentation. Instead of using archaeologically accurate replicas of weapons, short sword 'sections' were produced, whose "shape, composition, microstructure and hardness resembled those of Bronze Age swords" (2000: 92). These were then used with a tensometer machine to deliver strikes of a specific force. As Molloy has pointed out (pers. comm.), both the range of movement of a human delivering a strike and the shape and form of the sword as a whole will affect the outcome of such experiments, and it is therefore possible that Bridgford sacrificed accuracy for replicability. Molloy's work complements Bridgford's, and goes some way to ameliorate any methodological weaknesses, by conducting experiments with similar goals and results, but with the emphasis on authentic combat techniques (which necessarily sacrifice replicability). Archaeologically authentic replicas of Irish BA swords and shields were made and combat tested by the author after undertaking some basic weapons training. Both approaches found evidence of similar damage patterns on the swords. However, Bridgford did not apply the same approach to the spearheads and Molloy's examination was, in his own words, 'limited' (2006: 124) (although interestingly, his preliminary results indicate differences in the damage visible in the contemporary Irish and Scottish spearhead populations). Neither made any systematic attempt to link particular damage patterns to particular types of strike, and subsequently draw explicit conclusions on methods of use. Further, Molloy discussed some very interesting aspects of the functionality of bronze shields

which directly contradict Coles' (1962) work, but did not provide sufficient detail for such work to be built on without further investigation.

While there may have been limited focus on the functional usage of LBA spearheads, they have been comprehensively examined from a typological perspective. Greenwell & Brewis, Coles, Ehrenberg and Davis have all developed typological series for the British LBA spearhead population, all based on a numerical, alphabetical or descriptive series (as opposed to the swords, which tend to be grouped by site names). These seem to be variations on each other, rather than offering radically alternative groupings, and can therefore be fairly well integrated to provide a 'new' general classification system which incorporates previous work (see chapter 6).

Coles' experimental work into LBA shields focused on their functionality. His 1962 paper is mainly a discussion of the typological groupings of the shields, and their physical and technological features, while the find of a shield at Cadbury Castle, the only one of its kind at the time to have been found on an archaeological site in Britain, provided an opportunity to elaborate on both the Yetholm shield-type and the circumstances surrounding votive manufacture and deposition of such items (1999). Almost as an afterthought to the 1962 paper, a very brief account is provided of his experiments with one sheet metal shield and several leather examples. He explicitly states that he does not believe there is any possibility of augmentation of the metal shields with an organic backing and therefore his results lead him to conclude that metal shields are entirely non-functional, ritual objects. This view is still widely accepted, despite contradictory findings in Molloy's (2006) thesis. The opinion of this author is that Coles is incorrect in labelling all metal shields 'ceremonial', as it appears he may have been mistaken in respect of the absence of organic backing and neither does he consider the varying thicknesses of the extant examples, both factors that will affect the functionality of the artefacts. These issues are explored further in Chapter 4.

2.2.2 IA and EHP northern British material studies

Although the IA swords of Britain generally have received some attention, most

recently in Stead's (2006) excellent catalogue, iron spearheads generally, perhaps because of their extreme paucity and usually poor condition, have attracted far less attention. The only directly relevant work on IA material is Stead's (1991a) very brief discussion of spearheads from east Yorkshire, while Swanton's (1974) catalogue and typology of Anglo-Saxon examples is relevant to EHP examples. The lack of identifiably EHP swords precludes any similar works.

Although Chapter 5 considers the trajectory of research into IA swords and scabbards – particularly as an art source, rather than as functional weapons – Stead's (2006) recent volume is the most important catalogue of the IA swords of Britain, as a significant number had been discovered since the publication of Piggott's (1950) study. It is comprehensive and hugely useful, providing a typology, rough chronology and a range of discussions. It contains descriptions and, with only a few exceptions, drawings of the 275 iron swords or sword pieces found in Britain, 83 of which are northern British in origin. These are divided into 8 groups based on the typological groupings of the swords themselves, the scabbards, suspension loops, chapes and decoration. Again, size and morphology are the key aspects considered, although note is taken of context, where available. Of the six groups, groups E and F are specifically recognized as northern British and groups F and G contain examples from northern and southern Britain. The discussion is perhaps the most interesting section, making extensive use of contextual information to analyse the groupings, although at no point does Stead suggest that the contextual and associated items should influence the groupings themselves. He also explicitly states that conclusions regarding the use and functionality of the weapons cannot be achieved through archaeological means, while implicitly revealing a series of assumptions that could usefully be questioned.

Although there are no published catalogues or research into British, IA spearheads, Stead (1991a: 75) briefly discussed those found in east Yorkshire IA burials within his more general work on cemeteries from that area. His key observation was that they could be divided into two groups, A and B, based on the location of the maximum width of blade, which could then be further subdivided on the basis of

the relative lengths of the blade and socket. It is interesting that he found that group A spearheads were more likely to be found at Rudston and Burton Fleming, while group B spearheads were most likely to be found at Garton Slack and Kirkburn, as this suggests that the difference was one of social choice, rather than functional as is usually assumed in discussions of spear morphology (see Chapters 4 and 5). It is unfortunate, however, that even this minimal degree of interest is confined to a group so limited in its geographic and contextual range.

Unsurprisingly, given the almost complete absence of weapons dated securely to the EHP (see Chapter 6), there are no published works on EHP swords or spears from northern Britain. There is direct evidence for such weapons evidenced on Pictish stone sculpture, but those images have thus far mainly been analysed in terms of their art-historical value, or in terms of symbol meaning (Anderson, 2005: 185), and the first attempt to analyse the weapons depicted from a material culture perspective takes place in Chapter 6.

However, Swanton's (1974) synthetic work on Anglo-Saxon spearheads has a degree of potential cultural comparability to parts of EHP northern Britain, should further spearheads be identified. This is very much a typology with minimal discussion, although it does contain catalogue entries which provide some useful further information on provenance, associated weapons, current location and any related publications. Swanton's dataset is relatively large, consisting of 2,080 examples, which are placed within 12 groups – A-L. These series types are then further divided into 30 subgroups, the smallest of which (A1) contains 7 examples, while the largest (H2) contains 225. Each series type is defined by a diagnostic feature, although groups E-L are all apparently defined by an angular morphology. The variations within the series types are based on a selection of date, profile, distribution, point morphology, proportions and whether the sides are straight or tapering. As with any large dataset or large number of typological groupings there is wide variation in the distribution of the material across the typology, which is not necessarily a problem. However, while the series types are moderately distinguishable, the subgroups are far less so, their visual differentiation being difficult to make out and their categorization often containing considerable

overlap, significantly reducing the functionality of the typology. Furthermore, there is no comparison with contemporary or similar material found across Britain which could have placed this series in a wider context. More problematically, the absence of similar works examining such contemporary material may lead excavators to interpret spearheads found outside Anglo-Saxon areas as Anglo-Saxon, simply because there is no other framework within which to place them (Fraser Hunter, pers. comm.).

2.2.3 Experimental Archaeology Studies

Experimental archaeology is a hugely popular research approach when archaeologists wish to further understand the practical aspects of the material culture and technology of their chosen field. One of its earliest practitioners was Arthur Evans, who 'rebuilt' the palace at Knossos, and subsequently a huge range of experiments have been undertaken into such disparate subjects as settlements, ships, ceramics, monuments, metal- and cloth-working.

Although many of these experiments are visually exciting, an issue for archaeologists is their measure of scientific value. It was not until 1979 that John Coles published a series of guidelines in order to promote good practice for those conducting experiments, the essence of which was that any item to be tested or examined should look like the original, be made from the same materials and be created using the same technologies. Additionally, he noted the importance of record keeping during and after the experiments. As Coles himself notes, the use of prehistoric technologies is often problematic for archaeologists given our frequently limited knowledge of the techniques available to craftsmen and women of the past. It is interesting to note that Coles did not use his 1979 publication to analyse the validity of his experimental work on Bronze Age shields (1962). Had he done so, he would have seen that certain aspects of his methodology were flawed and these could have had a profound effect on his results.

Callahan (1999) built upon Coles' work by explicitly distinguishing between valid and invalid experiments and stating the conditions of each, in addition to emphasizing the need for a scientific methodology. He determined that there were

three levels of 'investment' in doing experimental work:

1. Non-authentic and non-scientific (otherwise known as 'play'): this level can involve making items that do not work with the proper tools, or making items that do work but with modern tools
2. Authentic but non-scientific (otherwise known as experiential): this level produces working reproductions made with the proper tools, but relates to *how* an item can be made rather than using the results to develop interpretation
3. Authentic and scientific (otherwise known as experimental)

The goal for archaeologists must be to achieve the third level; in order to do so, Callahan specified that each experiment must not be interfered with by the learning of basic skills, scientific monitoring must take place at every stage, duplication must be able to occur and publication must take place. Callahan's aim was to improve the practice of experimental archaeology and in this he succeeded, although there are two distinct disadvantages to rigidly following his guidelines. Firstly, such a methodology will inevitably require far greater investment in terms of time and money than had previously been supposed for rigorous experimental archaeology to take place. Secondly, striving to achieve 'experimental' status, at the expense of 'experiential' data, limits the potential of research projects, a potential solution for which is discussed below.

One aspect of the experimental design not touched upon by either Coles or Callahan is the issue of variables. Mathieu & Meyer (2002: 74) noted that variability in empirical results within or between tests could be caused by any one of a number of variables that might affect the experiment. These could include types and physical attributes of the items used, weather conditions, skills or strength of the experimenter and so on. Their solution was to document as many variables as possible down to the smallest degree, both those that are predictable and those that are contextual as the experiment takes place, after which strategies can be employed to prioritise their importance and minimize their individual effects. They felt that it was possible to control and limit the number of variables affecting individual experiments, which would allow better replication of results in later work. However, if one follows this strategy in a thorough manner, it is entirely possible to find an almost endless list of variables, many of which are only

recordable rather than controllable. Furthermore, in many cases it would be impossible to quantify the effect they would have on the experiment. Given the huge variety in possible experimental subjects, it would also be impossible to create an adequate checklist of variables for each researcher to consider while they work and so it seems most sensible to approach experimental design with the potential effects of variables in mind and to ensure that a note is taken of the most important ones. Although such a method is subjective, at least it takes the issue into account.

Taken collectively, the works of Coles, Callahan and Mathieu & Meyer form the key elements of the 'controlled' approach to experimental research design, as discussed by Rasmussen (2007). This advocates identifying and controlling as many variables as possible during the research design phase, achieving quantifiable results that can be duplicated and applying these to support or reject a pre-existing hypothesis. It is these aspects of the 'controlled' method that separate experimental and experiential approaches to archaeology and these have traditionally been viewed as the 'best' method of verifying hypotheses. However, Rasmussen also discusses an alternative, 'contextual' experimental design approach, which differs in its aim and organization. It does not concern itself with isolating variables or collecting formalized, systematic data but instead focuses on experiential, subjective findings designed to provide the archaeologist with arguments, inspiration and the opportunity to evaluate the relevance of evidence. Thus, experimental work becomes a circle of hypothesis, experimentation and analysis, rather than a linear project with a definitive end. Although there are issues surrounding how to appropriately document subjective experience in order to enable archaeological interpretation, the contributions of such experiences are increasingly found to be valuable and many recent experimental projects are making use of a combination of the 'controlled' and 'contextual' methods.

2.3 Alternative sources of evidence

Many published works addressing weapons and warfare draw on a number of sources of evidence in addition to weapons – mainly osteological-, textual- or site-evidence (Alcock, 2003; Harding, 2004; Harding, 2007). These are complex

sources of evidence which from a practical perspective could not be adequately studied and analysed in this thesis, although they are discussed in relation to the model of warfare in northern Britain presented in chapter 8. However, some aspects of osteological and textual examination in particular need to be addressed before they can be included in any arguments.

2.3.1 Osteology

Skeletons are one of the most direct sources of evidence for this topic, partly because they evade the charge made of fortified sites and weapons that they reference warfare, but are not direct evidence of it; trauma to skeletons is undoubtedly direct evidence of some form of violence. However, it should be borne in mind that evidence obtained from skeletons will form only the most partial picture of the reality. Firstly, published osteological evidence from northern Britain is relatively rare, due to a combination of variable practices connected with disposal of the dead leaving minimal evidence, poor taphonomic conditions and publication imperatives limiting the level of comprehensive recording and detail required for using the data in a range of different analyses (Anderson, 1996: 10; Arnold, 1995: 74, 79). Secondly, skeletons can only reveal occasions where an individual suffered a fracture or sharp force wound that damaged the bone, but not those occasions when the trauma was limited to the flesh. Despite the pejorative phrase 'only a flesh wound', such injuries can prove fatal as a result of blood loss, shock or infection. While the following will discuss specific occasions when the circumstances of the violence can be surmised, this is not always the case. Nor is it possible to determine at what age an individual sustained fractures that have healed; for example, whether they were a child or adult when it happened (Arnold, 1995: 73). Finally, it is worth considering that the life-ways of humans have changed such that the general likelihood of fractures, their causes and likelihood of breaking a particular bone are significantly different between modern and ancient populations (Arnold, 1995: 78-79.

2.3.1.1 Distinguishing conflict trauma from accidental trauma

Skeletal material is frequently in a very fragmented state, much of which can be ascribed to either taphonomic or excavatory/curatorial causes (Knüsel, 2005: 55). It can be very difficult to identify trauma in such fragmented remains, particularly in the case of crania (which is often the most common area showing combat damage) where the skull may need complete reconstruction to identify craniofacial fractures. Since levels of collagen in the bones determine how the bone will react to trauma, and those levels change after death, close examination can distinguish between ante- and post-mortem damage, but cannot indicate the cause of the trauma. Traditionally, studies of warfare have been wary of using osteological evidence on the grounds that it is not possible to distinguish between trauma caused by conflict and that caused by accidents (such as falls), socio-cultural practices (such as domestic violence or brawling) or self-infliction (Wakely [1997: 28] notes that in some cultures mourning rituals for women dictate cutting or striking the head repeatedly). Even recent studies (Osgood 2005; Wileman 2009) have shown an unwillingness to actively engage with current osteological research, despite the existence of frameworks developed to distinguish the mechanisms behind accidental and violent trauma, and between domestic and battle trauma.

The key considerations here are the type of weapon that caused the trauma, the type and locations of the fracture or injury and the cultural context from which the evidence comes. Where preservation is good, examination of the shape and form of the trauma, in conjunction with experimental work, has proven it possible to identify quite specifically what sort of weapon caused the damage (Arnold, 1995; Boylston, 2000; Knüsel, 2005; Novak, 2000; Redfern, 2009). Where the weapons involved are particularly specialised, such as the swords identified by Anderson (1996: 11-13) as causing the wounds on two individuals found in Dover, it would suggest the occurrence of a battle, rather than a street brawl for example. The location of the injury can also be illuminating. Arnold (1995: 73-74) notes that "with direct blows to the chest wall the fracture is more likely to occur in the middle or anterior part of the rib", which enabled Wells (1982) to identify a Roman cemetery at Cirencester in which 75% of the rib injuries were the result of deliberate inter-personal aggression, rather than accidents such as falls. Wakely (1997: 27) also notes that damage to the fronto-parietal lobe on the left side

suggests formal, face to face combat with a right-handed opponent (although obviously not all such damage will have the same cause). Although the mechanisms behind, and locations of, such damage can indicate deliberate action rather than accident, it cannot alone be taken as firm evidence of warfare. Similar damage can be caused by domestic violence, for example. However, Arnold (1995: 76-79) also found that the physicality of violence is a cultural construct, in that the areas of the body targeted change over space and time. In modern British populations, broken noses as a result of domestic or social violence are common, but this is not the case throughout the modern world, or in evidence from all prehistoric cemeteries (Walker, 1997: 146). As such, where there is sufficient evidence to obtain patterning of social violence a general distinction might be possible between conflict trauma and social trauma. The final issue for concern is how to distinguish between state-sanctioned violence in the form of execution, and state sanctioned violence in the form of warfare. In this case, a grasp of the cultural context is informative; textual accounts suggest that both the Picts and the Dal Riatans practiced drowning as a form of execution (Fraser, 2009: 298-299), while no mention is made of hanging or the use of edged weapons for the same purpose. None of these considerations can definitively identify combat trauma, but they can indicate likelihood.

2.3.1.2 Classifying trauma

Many osteologists researching combat trauma (Boylston, 2000; Knüsel, 2005; Novak, 2000; Redfern, 2008b) use three basic categories to distinguish trauma identified on skeletal evidence:

- Sharp force trauma (slicing wounds from swords, broader wounds from axes, piercing wounds from spears): as defined by linearity, well-defined and clean edges, flat and smooth polished surface, possible presence of parallel scratch marks on the bone surface when viewed by SEM
- Blunt force trauma (radiating fractures from compression, tension, torsion, bending and shearing): as defined by concentric or radiating fractures, depending on the force with which the blow was delivered. This form may dent, crack or splinter bone as opposed to the incision caused by sharp force trauma.
- Projectile trauma (a possible combination of the above, but with

accompanying markers suggesting the weapon involved was airborne – such as slings, arrows and javelins)

Most of the skeletal damage presented in Table 21 in chapter 7 is sharp force trauma, while Boylston (2000: 369) notes that injuries from bladed weapons are the most common form of trauma in the Anglo-Saxon areas of Britain during the EHP. However, he also notes that it is much more common to identify sharp force trauma than blunt or projectile trauma, and it is also more common to recognise a healed wound than an unhealed one (2000: 375). This is possibly because the ability to reconstruct fragmented skeletal evidence, and then identify instances of trauma as well as the mechanisms that caused it, is an extremely specialised skill – Redfern (2008b: 112) and Knüsel (2005: 51, 61) agree with Boylston that there is frequently inadequate expert analysis of osteological evidence, resulting in unsatisfactory interpretations. Consequently, it is difficult to determine whether the dominance of sharp force trauma accurately reflects patterns of the injury in the past, or whether it is the result of poor data-collection which leaves them over-represented.

2.3.2 Historical sources

There are a range of written sources relating to the IA and the EHP. The IA sources (Caesar's Conquest of Gaul and Tacitus' Annals of Rome and The Agricola) are Roman and are therefore of an obviously different perspective than the EHP texts, which include Bede's *Historia Ecclesiastica* (Colgrave & Mynors, 1991), Stephen's Life of Wilfred, Adomnan's Life of Columba (Anderson & Anderson, 1991), the Iona and Irish annals, the *Senchus fer nAlban* (Bannerman, 1974) and *Y Gododdin* (Koch, 1997).

Three issues relate to the use of texts in archaeological studies, which will be relevant in varying degrees to all the works mentioned above. The first point is that the texts themselves could have been subject to changes or corruptions since their creation, as they may have been copied and translated a number of times. This problem is particular evident in Koch's (1997) work on the earliest (13th century) surviving text of *Y Gododdin,* which is heavily corrupted and modernised. Koch created two translations, an Archaic and an Innovative version, which differ

significantly – the Innovative text contains more than twice as many references to weapons and armour than the Archaic version. The second issue is that the motivation and circumstance of the writer involved is a crucial factor when considering the veracity of the text. Both Caesar and Tacitus, in trying to 'spin' particular campaigns and present British society in particular ways to justify their own and others' actions, may have taken a flexible or dismissive attitude to the reality of Britain at this time. In addition, Caesar's presence in Britain was purely militaristic and limited – he did not advance far enough north to have had direct contact with those areas relevant to this study, and did not hold the southern territory for any extended period as part of the empire. He is therefore unlikely to have been able to grasp the nuances of normal southern British culture and customs which, since there are evident regional differences within IA Britain, may have been different to those in the north. EHP authors, such as Bede and Gildas, many of whom wrote from a religious perspective, tended to be profoundly partisan in their accounts of political and military events, depending on the religious history and affiliation of those involved (Alcock, 2003: 8-13). Consequently, such authors have been known to ignore or excuse brutal atrocities, even those committed against monks (Alcock, 2003: 9, 366). Frequently such texts were also written long after the events described and were thus liable to 'editing', according to the political or religious needs of the time – the records of some apostate kings were expunged from the Irish and Iona Annals in order to make it appear as if they never existed (Alcock, 2003: 10). Some were never intended to be literal accounts – *Y Gododdin* is a poem, while the Romans considered histories to be the closest prose form to poetry (Wooliscroft, 2008). As such, both *Y Gododdin* and Tacitus' works may be viewed more as art, than realistic accounts, and so are subject to artistic license when relating the details of events. The final problem of drawing on textual sources is that if they are uncritically applied to archaeological evidence they can limit and direct further work and inhibit the suggestion of alternative interpretations which may be equally valid. These general reservations should be held in mind during the discussion of textual evidence in section 8.5.

2.4 Database methodology

2.4.1 Provenance of the material

Many of the items studied in this thesis were recovered during the eighteenth and nineteenth centuries and boast a rather complex and often murky history, post-recovery. Few early collectors made notes on the context, method and date of recovery and what happened to the artefact subsequently. Where such notes were made, these may not have survived into the present due to multiple changes in ownership and possession, or labels and accession records becoming lost or mixed up once in the care of a museum. Additionally, early purveyors of antiquities may have been less than honest with the real provenance of an item in order to increase its value (Davis, 2006: 63). As a result, there is a contextual information bias in favour of more recent finds.

Finds made in more recent times, frequently due to industrial work such as quarrying or dredging, may also lack provenance as recovery of the artefacts becomes secondary to the task of completing the original work. While the find will be preserved, the specific findspot, context and any associations may subsequently be unclear. However, the advent of the Portable Antiquities Scheme and the growing willingness of the archaeological and metal-detectoring communities to work together and share information may begin to reverse this trend (Davis, 2006).

2.4.2 Mapping and regionality

The Eastings and Northings used to locate the finds in this study are accurate to 1km sq. However, even some of these may not be entirely accurate as, particularly with the finds discovered many decades ago, the findspot location provided may be imprecise, such as ‘near Falkirk’. Some items have had to be deliberately left without Eastings and Northings as the Digimap Gazetteer, provided by Edina, cannot locate the findspot provided, such as one bronze spear, described as coming from Clayyard, near Machariach, Arran. Finally, 6% of the bronze weapons (all but one of which are spears) within the database have no known provenance.

When considering which variables to use in the cluster analysis, it was important

to find a way to include find location. Eastings, Northings and placenames were not compatible with the software application, so it was necessary to be able to place each artefact in a particular region which could then be coded and analysed. Several authors, working on Bronze Age and Iron Age material, have divided northern Britain into regions, based usually on material culture, but also taking into account typological distributions and geography (Harding 2004, Haselgrove et al 2001, Bridgford 2000, Stead 2006, Alcock 2003). These regional groupings are roughly correlative (see Fig. 1) and have been used in this thesis to place finds within a region.

Region 1, the Atlantic seaboard, and Region 2, the north east, are taken from Harding (2004) and Haselgrove et al (2001). Region 3, the Borders, is taken from Harding (2004) and Bridgford (2000). Region 4, north west England, and Region 5, north east England, are taken from Bridgford (2000), Haselgrove et al (2001) and Stead (2006). Region 6, the east riding of Yorkshire, is taken from Bridgford (2000), Alcock (2003) and Stead (2006).

2.4.3 Continuity

It is of concern that the data contained in this work fulfil continuity criteria, meaning that previous and future work can be easily compared with that found here. For example, Davis (2006) deliberately modelled his database fields on earlier relevant work by Bridgford (1997, 2000) and York (2002). Since the categories described, and their associated scales, used by all three are relevant to this work and seem logical in their application, they have been incorporated here. Categories based on earlier work include: 'completeness' (scale 1-5) taken from Bridgford (1997), 'edge damage' (1-4/5) taken from a combination of Bridgford's (2002) edge damage and York's (2002) wear and tear categories, and 'purposeful damage' (1-4) taken from Davis (2006) (see section 2.3.4).

2.4.4 'Phantom' spearheads?

It is harder to develop a comprehensive database of spears than swords, due to difficulties in finding them. Spearheads, particularly those deposited in museums some time ago, are frequently less well examined and recorded than swords and

consequently, while it is possible to find a great many references to spears, the information relating to them is often missing – no record of find location, current location and accession number make such a job very difficult. With the minimal information available it is sometimes possible to find an item, but the search is time consuming and frequently unrewarding. This has led to a focus on swords in past and present research, and conclusions drawn regarding warfare are consequently rather imbalanced.

Attempts have been made to rectify that imbalance here. In many cases references to a spear in different publications related to the same item, reducing the number of actual spears in contrast to references to spears. Other works make references to spears that appear to be irretrievably lost. Finally, serendipity sometimes allowed me to visit a museum to examine a spearhead, only for the curator to present me with another one or two that I had never found any other reference to. Indeed, occasionally spearheads were found in storage whose existence had previously been unknown even to the curator.

Therefore, given the shifting nature of museum collections, the paucity of records, the luck involved and the varying sources of information, it is impossible to claim to have a definitive and comprehensive database of the relevant material. All it is possible to do is plainly state all the information sources which were engaged and the method employed to search them (see Appendix 3) and provide the catalogue of material examined (see Appendix 1).

2.4.5 Examination

Having identified a range of material relevant to this study, information on each item needed to be placed within the database. In terms of cataloguing, each item was initially recorded with a combination of letters (to identify what material and artefact type it was):

1. BSP = bronze spear
2. BSW = bronze sword
3. ISP = iron spear
4. ISW = iron sword

5. SH = shield

6. IA = iron armour

Numbers were then added to distinguish each object from others in its group (e.g. BSP45).

Once these objects, and any relevant contextual information, were listed in the database, it was imperative to examine as many of the artefacts as possible, although financial and time constraints prevented comprehensive examination. Given the amounts of material available, and the number of material-focused studies, relative to the LBA and later periods, it was felt that a focus on the ferrous artefacts would be more productive than ensuring an examination of all bronze weapons which may already have been comprehensively published. It was therefore decided that, where possible, all the IA and EHP material would be personally examined and only the collections of LBA material held in the BM and NMS would be viewed. Fortunately, these two museums hold a high proportion of the total population.

Material Type	Total Number in Database	Total Number Examined	Percentage Examined
Bronze Spearheads	222	89	40
Bronze Swords	221	93	42
Iron Spearheads	120	119	100
Iron Swords	62	62	100
Armour	2	1	50
Shields	22	7	32
----------	649	371	57

Table 1: Material in the database

The armour, arrow, chape, pommel, scabbard and shield tables hold information regarding type, date, find location and current location, associations and any other relevant information in a text report. The sword and spearhead tables, while also containing this information, are far more detailed, providing information on: context, method and date of recovery, a wide variety of measurements and notes,

and levels of particular damage types on specific areas of the weapon. In order to distinguish between damage areas, the sword blades have been divided into four sections, while the spearheads have been divided into the upper and lower blade areas (see Figs. 2 & 3). In addition to these fields, photographs of each artefact were taken for reference.

2.4.6 Descriptive labelling

One of the key methods of dividing and analysing the material in the database is based on context, but classification here is not entirely straightforward. The contextual classifications used within the database are hoards, burials, settlements and 'other'; categories which require some further explanation to eliminate confusion in cases where an overlap occurs. Any objects found with a burial, even where there are multiple items, will be classed as a burial on the assumption that the burial itself is the primary motivator for deposition. Any object found in conjunction with one or more other objects has been classified as a hoard; where these have been found on sites which may also suggest a settlement context, the hoard takes precedence as the associations are here deemed the most important aspect of the group context. Single finds not in association with a burial will then be classified with a context of either settlement or 'other'. There are occasions when contextual information associated with a weapon has not explicitly noted a settlement origin, although the location would suggest such a categorisation, and in these cases the object has been classified with a settlement context. A settlement context should not be taken to imply a lack of votive intent, it simply reflects findspot and lack of associations. The 'other' category includes artefacts with no known context, or those such as BSW154 which have some contextual information (it was said to have been found under a rock) but not such that it can usefully be placed within the classifications outlined above.

Many of the comparable fields in the database require data that cannot be entered with a simple positive or negative or a measurement; instead they are graded on a subjective scale in order to enable direct comparison. These include:

1. *Ricasso indentation*: 0 = none, 1= slight, 2 = present, 3 = accentuated
2. *Midrib*: 1 = no midrib, 2 = midrib present, 3 = midrib pronounced

3. *Section shape*: 1 = lozenge (diamond), 2 = flattened lozenge, 3 = lozenge with accentuated bevel, 4 = lenticular (rounded oval), 5 = flattened lenticular, 6 = lenticular with accentuated bevel (see Fig. 6)

4. *Completeness*: 1 = complete, 2 = substantial damage to terminal/hilt and/or blade tip, 3 = most of hilt or tip missing, 4 = fragment, 5 = more than one piece present

5. *Purposeful damage (PD)*: 1 = no evident PD, 2 = broken blade evidenced by hacking, 3 = more than 30º bend or more than one bend, 4 = combination of the above, 5 = burnt (the damage caused by burning was considered to be such that it would obscure any other, previously inflicted forms of purposeful damage)

6. *Condition of edges*: 1 = sharp and clear, 2 = some obscuring corrosion/damage, 3 = lots of obscuring corrosion/damage, 4 = edges too damaged to detect edge wear

7. *Edge damage*: 0 = too damaged to tell, 1 = none, 2 = slight, not necessarily combat, 3 = combat, 4 = severe (as from an axe), 5 = catastrophic (as from hacking into pieces)

8. *Point morphology*: P = pointed, PF = pointed and flattened, R = rounded, RF = rounded and flattened, M = missing

Where possible, it is important that these descriptive labels fulfil continuity criteria and have therefore been adopted or built on previous work (see section 2.2.2).

2.4.7 Subjectivity

It is noticeable, particularly in respect of the database fields mentioned above, that several aspects of the material examination are subjective. In some cases, it is possible to limit this subjectivity, as in the case of 'Completeness' or 'Purposeful Damage', where the descriptive labels attempt as much specificity as possible. In other cases, such as 'Condition of edges' or 'Edge damage', this is more problematic and the researcher must rely on his or her own judgement. The identification of form type for the iron spearheads poses a similar problem, given both the poor preservation of the edges (which obscures the original outline of the object) and the high numbers of artefacts whose morphology is such that it could reasonably be classified as one of two different forms. While a level of

subjectivity in this particular area is inevitable, it is to be hoped that a catalogue of iron spearheads will be published in due course, so that subjective decisions regarding form, upon which classificatory systems are subsequently based, can be considered with reference to drawings of each individual item. Intra-study comparisons will perhaps suffer less from this effect (given that the judgement of the author affects all of the artefacts in question equally), where the results of this study can be compared with those of others', it is important to note this qualification of the results.

2.4.8 Edge wear analysis

Bridgford (2001) identified six types of edge damage that LBA swords were likely to sustain during combat - bowing, notching, chipping, scoring, nicking and tearing (see Fig. 7). These types were used as a template during this study but with some reservations. It is a matter of judgment on the part of the individual whether the smallest microscopic damage will be considered pertinent and with any mark, it is frequently extremely hard to distinguish between combat damage, other pre-depositional damage, corrosion and other post-depositional damage. Further, descriptions of combat damage are subjective even when employing the Bridgford template, as some marks are a combination of two or more types of damage. Therefore, considerable conservatism has been employed when examining the material in this study; any damage visible to the naked eye, however small, has been included but it must clearly relate to one or more of the damage types. Those marks which are not definitively combat have been disregarded.

2.4.9 Limitations of the material

Measurements taken of the ironwork are not as likely to be as accurate as that taken from the bronze – build up of rust and blistering can distort the exact original size so that measurements become more of a rough guide. ISP136 is an example of spear clearly displaying a prominent and sharp midrib that in areas has been corroded to such an extent that it appears not to be there at all. Therefore it is quite possible that many of the iron spearheads that are classified as having no midrib may originally have had one, but it is no longer visible except under x-ray.

2.5 Chapter discussion

This study has been deliberately designed to build on previous work, continuing with, and adapting, previous theoretical and practical approaches, and plugging gaps in the relevant research.

The theoretical approach taken here strongly advocates the view that warfare should be seen in a broad social context as a normalized activity, allowing for reflections on the effect that participation in warfare has on society and the effect on the practice of warfare of societal structures and customs. Practically speaking, this will involve a materialist approach, examining the weapons panoply of each time period in detail, but where this is not possible other sources of evidence may be referenced.

The key publications on material studies indicate further work is required in three particular areas, which this study hopes to address. Firstly, materially speaking, LBA spears and shields need to be reassessed using an experimental approach, as current, widely held assumptions regarding their functionality and modes of use are questionable. Functionality and modes of use are key aspects of weapons studies, as they affect the material chosen for study, the approach taken by subsequent researchers and enable significant re-evaluation of the experiential practice of warfare in the LBA. In such experiments, it is the aim to follow the highest standards possible, as discussed by Coles (1979), Callaghan (1999) and Mathieu & Meyer (2002). The experimental work discussed in Chapter 4 met the highest criteria set by Coles and Callaghan, although the possibility of testing under all possible variations of all possible variables suggested by Mathieu and Meyer proved impossible, given constraints of time and money. However, those variables felt to be most important were given priority during testing the experiments (for example, the attacker and defender were rotated so that the impact of the differing size, weight and strength of the combatants would be minimised), and it is to be hoped that the detail in which the methodology of the experiments is described will reassure subsequent researchers as to the validity of the results obtained. Secondly, the ferrous spearheads of northern Britain need to be comprehensively examined and catalogued. Although similar attempts have

failed in the past, a new multi-variant statistical approach will be employed in order to attempt to shape the dataset into a typological series (see Chapter 5). Thirdly, the lack of publications on, and evidence for, weapons dating to the EHP suggest that an alternative source of evidence needs to be sought to determine the extent to which conclusions regarding the material culture and social role of warfare can be deduced when the primary source material is absent. To that end, iconographic representations of weapons and warriors on Pictish stones will be examined in detail in Chapter 6.

Chapter 3: Northern British Weapons

The research results presented in this thesis are based on a database of all the swords, spears, shields, chapes, pommels and scabbards from the area and chronological periods under discussion. This was created in order that it might be analysed to provide a range of information on warfare generally. However, its creation proved to be complex and subjective, and the possibilities and constraints of the data inevitably dominated the answers that could, and could not, be derived from it. The purpose of this chapter is not to provide analysis of the contents of the database, but to explain it. The meaning of words used, the type of information held on each group of artefacts and general details on the members of each group will be discussed, enabling the reader to identify the sources (and indeed absence of sources) that the subsequent work is based on. Two of the crucial questions asked by this thesis are whether (and in what way) weapons were being used, and what meaning they might have carried for the populations in which they were made and used. To examine these questions, the database contains information on edge-wear patterns and levels of breakage, repair and purposeful damage (that is, deliberately destroying the sword before deposition), as well as the variables of find context, associations and decoration; the degree to which these factors are relevant for, and visible on, each group of artefacts will also be discussed. Only generalised patterns in the database will be discussed in section 3.6, before raising the issues and questions which will be covered in depth in the following chapters.

Not every item in the database could be studied first hand, or has been thoroughly published in the past. Of those that were examined a great number were so fragmented or poorly preserved that it was impossible for them to be classified within existing typologies. For this reason, where a percentage is given ("X% of swords show edge wear damage", for example) the figure provided is the percentage of the total of examined, classifiable pieces within the database, rather than the dataset as a whole, unless stated otherwise.

3.1 Terminology

Throughout this work, various weapons and actions will be discussed explicitly and in detail, and it is necessary to unambiguously explain the terminology used, as the use of incorrect or inconsistent wording, can lead to misunderstanding.

3.1.1 Offensive acts

Strikes are an aggressive tactical manoeuvre, making use of a weapon to overcome an opponent, and can be made in two forms; thrusting and cutting.

Thrusting strikes aim to cause damage using the point of a weapon, usually in a directly linear movement, to pierce skin or defensive armour. Such damage can be exacerbated if the weapon in question has a relatively narrow blade and sharp edges near the point, cutting wider and deeper as the blade travels its course. Factors which will affect the efficacy of a thrusting strike include force, trajectory, point and edge morphology of the weapon and the material it comes into contact with.

Cutting strikes are more complex. The damage caused by such a strike can involve:

1. Piercing in conjunction with percussive damage
2. Piercing in conjunction with lacerative damage
3. Percussive damage (Amberger, 1998)

Molloy (2006: 21-22) describes the first type of damage as occurring when a heavy weapon is used to make a forceful strike before the edge is drawn across the target. The second type (generally described as a ‘draw-cut’) requires the impact of the blade and the slicing motion to happen concurrently, so that the damage is caused by the laceration, rather than the force of the blow. Distinguishing these first two types of damage solely through the movement required is not ideal, as in practice the movements are very similar and the variables that will directly affect the damage outcome are the weight of the weapon, the strength, speed and arc/angle of the strike and the sharpness of the blade. Therefore, these two can be practically combined into simply ‘piercing strikes’. The third type of cutting

occurs solely through percussive force, when flesh and bone will split under pressure from the edge of the weapon. In this case the weapon does not necessarily need a sharp edge as success depends purely on the force involved; such a strike can even negate the protective effect of armour, since the transfer of energy in such a small area can break bones and severely damage soft tissue.

In addition to thrusting and cutting strikes, throwing strikes (which are made only with spears) are also relevant here. Throws can be made in two ways; standing still and using the power of a single arm and the torque of the body to make the throw (still shot) or using the momentum of a run-up to provide power (javelin shot). The first technique requires the target to be relatively close to the spear-bearer but enables a degree of accuracy in terms of aim and increases the chance of successful point penetration. The use of the second technique enables a cast to travel a much greater distance (an experienced spear caster can cast a spear at least 15m with relative ease), but minimal accuracy in terms of aim is achievable and any damage done is entirely dependent on the angle of the cast and landing.

A key issue of all strikes is that their success depends not simply on the strength of the user or the quality of the weapon, but the ability of the user to adapt strikes to suit themselves and the type of weapon being employed. The most effective modes of use will depend on aspects of the weapon, including the weight, balance, grip, morphology, sharpness and the presence or otherwise of bevels or a midrib, aspects of the user, including strength, height, stamina and defensive equipment, and aspects of the target, including material and movement. Essentially, skill and experience are paramount when using edged weapons, not strength. Although the aspects of the user cannot now be reasonably identified, the key aspects of the offensive and defensive weapons are noted as part of the physical information gathered within the database.

3.1.2 Defence

There are two forms of defence relevant to this study: blocking and parrying. Blocking involves meeting an incoming strike directly with another weapon or a shield, so that both lose momentum and the initial force has to be absorbed by the

defending weapon or shield; essentially a static defence. Such a method requires significant expenditure of strength on the part of the defender, while also risking damage to the defensive weapon or shield, and is therefore rarely used, although Molloy (2006: 23) notes that it can be useful when used swiftly to shut down an oncoming strike before it is fully developed. Parrying involves directing the force of an incoming strike away from its intended target with either a sword or shield, which may also unbalance the attacker and leave their guard open. This form of defence causes far less damage to the defending weapon or shield.

3.2 Northern British swords

The word 'sword' in this context indicates a metal blade with two sharp edges, with a shorter section for the handle - the outer part of which would usually be comprised of organic material such as wood or bone (which is no longer extant), although solid metal hilts are not unknown in the LBA. The area of the blade towards the tip is described as the 'upper' part of the blade, and the area near to the hilt as the 'lower' part.

3.2.1 Bronze sword form and function

The principal mode of use of the sword is conventionally derived from the morphology of the blade. By the LBA, blade form had mainly developed into a leaf shape (see Fig. 3 for form and features of these swords), although a few early types maintain the parallel sides more typical of MBA dirks and rapiers. Harding (2007) concisely summarises the arguments of a variety of authors (Brewis, 1923; Gordon, 1953; Bridgford, 1997) who posit that such a shape was more versatile than the thinner, MBA versions, and as such that leaf-bladed swords were ideal cutting, thrusting and slashing weapons. However, he also notes that sword use was as likely to be determined by context, than by morphology. It is therefore of interest to examine the swords themselves closely for edge-wear which might provide indications of use, as well as evidence of the process of edge hardening (hammering the edge to increase sharpness and make it more resistant to damage) (see Fig. 8) – such edge hardening is itself evidence of anticipation on the part of the manufacturer.

In developing the fields relating to 'area damage', the goal was not only to state whether it was present, but also in what form and specifically where that damage lay. Different fighting styles will leave particularly damage patterns upon a blade – the simplest example of such a pattern is that defensive damage upon a sword will usually fall near to the hilt, while aggressive action will leave damage on the area of the blade nearer the tip. Resorting to such measurements as '30cm from the hilt' to convey damage locations will result in misleading information, since the differing sizes of the weapons could cause this to indicate either the narrowest point of the blade, or much further towards the widest point, affecting the ultimate interpretation. In order to convey both accurately and without subjectivity where damage falls, each blade was divided into four areas (see Fig. 3):

1. Area 1: the 10% of the blade nearest the hilt
2. Area 2: the 20% of the blade below that
3. Area 3: the 50% of the blade below that
4. Area 4: the 20% of the blade nearest the tip

3.2.2 Bronze sword database

For most classes of artefact there is usually a widely used and accepted typology which allows analysis of the artefacts as a group, although some are more controversial than others (see chapter 5). Bronze swords were discussed in Coles' series of articles on BA metalwork (1960, 1962, 1969) but the most widely accepted typology is that of Colquhoun & Burgess (1988), who developed a comprehensive catalogue of the bronze swords found in Britain. The 221 swords, or sword fragments, found in northern Britain are detailed below, together with their chronology and the numbers in which they have been found. Of these, 93 (42%) were able to be examined fully.

Category	**Type**	**Numbers**	**% of Total Weapons**	**Date (BC)**
Griffplattenschwerter	Rosnoen	1	0.5	1,300 – 1,200
"	Solid Cast	3	1	1,200 – 1,100
"	Ballintober	1	0.5	1,200 – 1,100
	Unclassified	1	0.5	1,200 – 1,100
Early Urnfield Flange-hilted	Limehouse Mugdrum Variant	1	0.5	1,200 – 1,100

“	Taplow	1	0.5	1,100
“	Wilburton A	1	0.5	1,100-1,000
“	Wilburton B	2	1	1,100 – 1,000
“	Wilburton G	5	2	1,100 – 1,000
“	Wilburton Unclassified	4	2	1,100 – 1,000
“	Ewart Park 1	14	6	900 – 700
“	Ewart Park 2	47	21	900 – 700
“	Ewart Park 3	7	3	900 - 700
“	Ewart Park Cherwell Variant	2	1	900 – 700
	Ewart Park Unclassified	65	30	900-700
“	Caledonian 1	5	2	900 – 700
“	Caledonian 2	9	4	900 – 700
“	Caledonian Unclassified	6	3	900 - 700
“	Carp's Tongue	1	0.5	900 – 700
Western European Gundlingen	Gundlingen B	2	1	800 – 600
“	Gundlingen C	2	1	800 – 600
“	Gundlingen D	4	2	800 – 600
“	Gundlingen Unclassified	5	2	800 - 600
Antennenschwerter	Antennenschwerter	1	0.5	900 - 700
Unclassified	Unclassified	31	14	-----

Table 2: LBA swords of northern Britain

The swords are divided on the basis of the morphology of the hilt, the rivet and/or slot arrangements in the grip, morphology of the grip, shape of the shoulders, type of ricasso and blade shape. Given how dependent classification is on the type of handle and how many of the swords have lost this area, the high number of unclassified items is unsurprising.

The morphological style of the majority of the LBA swords is relatively homogenous. Although the earliest Griffplattenschwerter swords are heavy, straight-sided weapons, as the LBA moves forward the key developments are the

emergence of leaf-shaped blades and flanges on the handle. Such developments are usually considered to reflect the changing usage of swords, in that the leaf shape lends itself well to slashing and thrusting movements. The exception here is the Carp's Tongue sword – only one of which has been found in northern Britain. This type has significant differences from the other types in relation to its tang morphology, and both the section shape and outline of the blade – the latter leading to suggestions that this type was designed specifically to be capable of stabbing, as well as slashing (Osgood, 1998: 81, 114). The variations of the Carps Tongue swords from the insular development of the other forms, their rarity in Britain and the continental influence on their style led Colquhoun and Burgess to posit that these swords were imported from Europe and were essentially a French type.

Of the 93 swords examined first hand, 70% have edges sufficiently preserved to enable examination for edge damage. Of these, at least 43% are edge hardened and 66% show some form of use damage – in the form of notching, nicking, bowing, tearing, scoring or chipping (see Fig. 7 for illustration of damage types and chapter 4 for a discussion of edge damage).

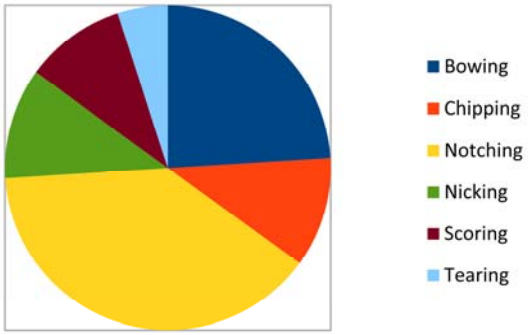

Illustration 1: Proportion of edge damage types on LBA swords of northern Britain

Other than edge-damage from some form of combat use, a significant proportion of the swords show other forms of damage; 20% have been the subject of purposeful pre-depositional damage, in the form of a broken blade caused by catastrophic and repeated hacking (most probably using an axe), a bend greater than 30°, more than one bend, burning or some combination thereof.

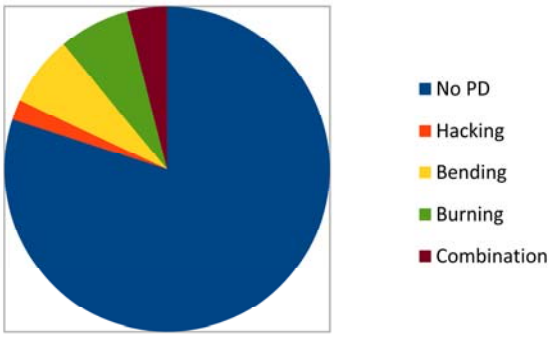

Illustration 2: Proportion of purposeful damage types on LBA swords of northern Britain

There are also examples of damage that have been repaired. Although small damages to sword edges can be ground away, a severe instance of edge damage or a blade break cannot be repaired; the only solution would be deposition or melting down and re-casting the object. However, where the hilt section snapped, the weapon could be repaired. The majority of the sword types have integral, cast tangs to which organic pieces would have been attached to form the hilt occasionally using slots, but more often rivets. Such an arrangement is probably mirrored by the Ewart Park Cherwell Variant type, although with the entire hilt cast in metal. Although much is dependent on the quality of the casting and the alloy used, the high instance of hilt failures seem to indicate a weak point in the sword design. Of the swords still possessing an extant hilt, 66% showed some level of hilt breakage, usually snapped off halfway along the grip. This figure does not include those where at least one of the rivet holes were torn. Of these damaged examples, 26% were repaired by re-casting the broken piece back on.

Unfortunately, many of the cases in the database lack contextual information, such as findspot and the presence and nature of associated material, possibly due to the frequently inadequate recording of finds discovered prior to the second half of the 20th century – only 113 of the swords in the database have a date of recovery or similar (whether that be the date it was presented to a museum, when information on it was published etc) and of those, 98 were found prior to 1950. A total of 94 (43%) of the swords have a recorded find context or details of associations (of these, 100% have a context, while associations are recorded for 99%).

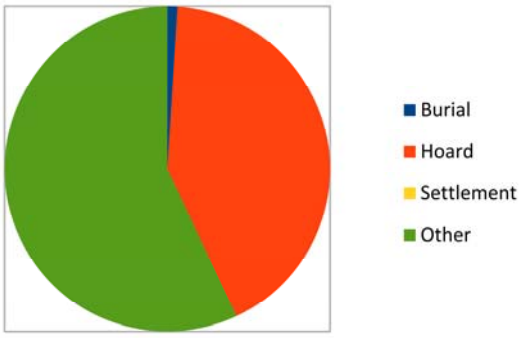

Illustration 3: Contexts of LBA swords of northern Britain

Few of the swords show any form of decoration; of the 6 that do, it consists of functional features, such as the midrib or edge hardening, sufficiently exaggerated as to render them at least partially stylistic in nature. Indenting or scratching patterns into the blade would have been possible, as would the use of a punch, but did not occur, possibly because of cultural resistance to such decoration (either generally, or on weapons in particular) or possibly because decoration occurred on the organics attached the hilt or scabbard.

3.2.3 Bronze swords in context

The swords found in northern Britain can be traced developmentally from earlier insular types, although there are such strong links to continental types that it seems likely that generalised trends in weaponry were occurring across western Europe at this time, with more minor stylistic differences taking place locally. Of the early Griffplattenschwerter swords, Colquhoun and Burgess (1988: 15) posit that the Rosnoen type is similar enough to continental finds that these may have been shipped from the continent, rather than manufactured in Britain itself, while in contrast the hilts of the Solid Cast swords seem to be a continuation of the indigenous tradition of middle Bronze Age rapier hilts and would have been an insular development (1988: 17). However, with the exception of the Carp's Tongue sword, which exhibits French or Italian influences and is most likely to have been brought to northern Britain rather than made there, the flange-hilted swords appear to have developed indigenously in a traceable manner (1988: 67, 110-111). Although many types found in northern Britain have strong continental and Irish parallels (in particular, the Ewart Park and Gundlingen swords are similar to the

Irish Class 4 and 5 swords respectively), they were part of wider developments that were taking place across Britain. The only group of swords that are unique to Scotland are the Ewart Park Caledonian series; perhaps it should be no surprise to find a unique variant in Scotland, since it is thought that Ewart Park swords evolved in northern Britain and then spread south (1988: 68).

Development of weapon types aside, there are some crucial differences between the northern British and southern British material groups. Firstly, there are the relative numbers and range of sword types. While twenty-one different types of sword are found in northern Britain, there are forty types found across Britain as a whole. This discrepancy is not wholly due to differences in geographic area, but variations in exchange networks, metalworking traditions, depositional practice and other cultural factors may all be highly relevant. Secondly, there are two crucial differences in terms of the context between the northern and southern finds. Colquhoun and Burgess indicate that hoards dominate the northern material, while at the same time exhibiting far less evidence within those hoards for the ritual 'killing' of the weapons than is seen in the south (1988: 9, 89). Such disparity has implications for the respective life-cycle and symbolism of the weapons from north and south Britain.

3.2.4 Iron sword form and function

Iron swords differ from their bronze counterparts in blade shape; the leaf form of the LBA gives way to either parallel or very gently tapering sides. Where the tip survives and is not encased in a scabbard, the morphology falls into one of two quite subjective categories (Stead, 2006: 9): 'long points', which taper in the final quarter of the blade to a "long, sharp point", or 'short points', which have a "less pronounced taper terminating in a short point". Although no longer exhibiting the leaf-shape so associated with a range of uses in the LBA, these swords were also quite capable of use as slashing and thrusting weapons; certainly the blades are sturdy enough to withstand the forces involved in making a slashing strike. However, the success of a thrusting strike is partially dependent on the morphology of the point, and here only the pointed examples (35%) would have made such a strike easy to accomplish. In turn, this suggests that it was the edges

of the IA swords that were most in use – a method of use requiring greater skill and space than thrusting-dominated modes of fighting.

Another feature of the iron swords which would have exhibited considerable variation were the hilts. Unfortunately, the majority of hilt components are no longer extant, but the pommels remain and these are divided into twelve descriptive categories in the database, although in some cases only on the basis of a single find. The degree of variation appears to be a purely aesthetic choice since none would support the kind of fitting that would enable the pommel to be used in a strike (as could occur with some of the solid cast pommels seen in the LBA). The IA tangs to which the pommels attach are very different in style than during the LBA, probably as a result of manufacturing methods. Instead of casting a grip-shaped tang and then supplementing it with organic material, the IA tangs tend to be thin circular or square-sectioned lengths of metal, requiring more substantial hilt pieces to be slotted on to it.

One evidential source associated with the iron swords are the scabbards (see Fig. 4) for details of these and other key fittings). Where a scabbard or scabbard fitting is found without the sword it has still been entered in the IA sword database. The two features of the scabbards that indicate functionality are the attachment loops and the chapes, the locations and styles of which will dictate how the sword is worn on the body and how it might be drawn.

3.2.5 Iron sword database

Ideally, this section would be split in two in order to consider the IA and EHP material separately. However, of the 73 classifiable iron swords, sword fragments, scabbards or scabbard fragments in the database, only two are certainly dateable to the EHP. One is from Harviestoun House in Clackmannanshire and is Anglo-Saxon in type, and one consists of a group of fragments from Carronbridge in Dumfries and Galloway which have been dated to 400 – 800 AD on the basis of associated material. There are problems in dating this material (see Chapter 6 for a full discussion), and at least some of the remaining 71 items that are either undated or thought to be IA could date to the EHP instead. In addition, a further 24 swords

are unclassified, or unclassifiable, and may also date to the EHP – although based on the find locations, most are very likely to date from the IA.

Prior to the 1950s, the IA swords of Britain were successively described with a variety of nomenclature – Greek/Etruscan/Roman (Thurnam, 1871), Early/Middle/Late La Tene (Tischler, 1885), groups 1-6 (Piggott, 1950) and A/B/C (Hawkes, 1959). During the 1970s, two theses were written with the intention of being complementary to Piggott's work; although Spratling (1972) found that Piggott's classification was unsatisfactory for southern Britain, MacGregor (1976) found that it was satisfactory for northern Britain (with some minor adjustments). In response, Stead (2006) began work on the catalogue that has become the primary, and certainly most comprehensive, source of reference for this group of swords and scabbards, and from which, of necessity, much of the information below is drawn. The 73 relevant artefacts in this group that are found in northern Britain are detailed below, together with their chronology and the numbers in which they have been found:

Type	Numbers	% of Classified Weapons	Date
E	16	34	200BC – 1BC
F	19	40	1AD – 200AD
E/F	5	11	200BC – 1BC
G	2	4	200BC – 1BC
H	5	11	1AD – 200AD
Unclassified	26	----	----

Table 3: IA swords of northern Britain

This group of material has some key, interlinked issues associated with dating and classification. Very few of the artefacts have been found with associated diagnostic artefacts and so the chronology is almost entirely reliant on typology. However, many of these artefacts are also in a very poor state of preservation; advanced states of corrosion, blistering and breakage are common, making examination, measuring and (crucially) classification extremely difficult in many cases. It is therefore unsurprising that the chronology of this group is quite limited, and really only extends to dividing the material into 'earlier' and 'later' groups.

For those artefacts complete and well-preserved enough to classify, this is achieved through four variables, three of which relate to the scabbard and one of which relates to the sword itself. These are (with the percentage which are classifiable) scabbard materials and construction (40%), suspension loop style and arrangement (22%), chape material and style (20%) and hilt end type (32%). Most are lenticular in section, and occasionally exhibit a median ridge or midrib, although these features are not relevant to typological grouping. With only one recorded exception (which is no longer extant but was considered an outlier), the northern British swords are not longer than 620mm and there is no marked division between the majority of swords and the short swords (classified as blades less than 440mm in length) (Stead, 2006: 5).

Stead identifies eight overall types of IA sword, labelled A-H, only four of which (E, F, G and H) are relevant to the finds from northern Britain. Group E are of medium length with campanulate hilt ends and scabbard mouths, while the scabbards are made of copper alloy front plates and iron back plates, entirely of copper alloy or entirely of organic materials. Only one of this group was examined metallographically in Stead's study, but it shows a higher level of technical accomplishment in terms of manufacture than the other nine British blades sectioned during that research, appearing to have been deliberately carburised, quenched and tempered (2006: 58). As regards context (which is discussed in detail in Chapter 7), although the problems with a lack of contextual details seen in the LBA apply equally here, Stead did identify some contextual patterning relating to the typological groups discussed here. The majority of the Group E swords were found associated with burials, usually crouched inhumations. At least six of these burials involved 'speared' corpses, where spears had been hurled down into the grave once the dead body had been placed there, while one burial associated with a Group E was one of the cart burials at Wetwang Slack. Only one Group E has been recovered from a river.

Group F swords are of medium length and have straight hilt ends, while the scabbards have straight mouths and are made of bronze, brass or organic materials. Only the metal scabbards have metal fittings; the suspension loops for this group

are centrally placed and the loop plates are very long. The earlier metal chapes have frames with bridges and bifurcating ends, but the later types lack frames. Two swords of this group were sectioned for Stead's study, and both were carburised. It appears that one had a complex structure that may be an approach to pattern welding, albeit with softer edges than other contemporary blades. The context of this group is not as homogenous as the Group E swords; only five were found in burials (three of which appear to show placement of the sword at the back of the individual, much as the chalk figurines found near Wetwang Slack show them being worn [Stead, 1988: 13-19]). The others were found in hoards, as loose finds, or have conflicting accounts of their provenance. Again, only one, the Sadberge sword, may possibly have been found in a river, but its provenance is ambiguous.

The swords labelled as E/F are those which have enough classificatory features to place them within one or other of these groups, but which are missing one or more of the necessary indicators which would identify them fully. Group G, of which there are only two extant examples in northern Britain, are short swords with anthropoid handles – the pommel consisting of a 'head', flanked by upraised arms. Only one was found in a burial, but both were probably buried deliberately. Group H contains those swords dating to the 1st century AD that Stead believes meld elements of the previously separate northern and southern sword and scabbard traditions to create new features and those that might have been Group F, had they been more complete. He does not discuss the extent to which Group H swords may have resulted from Roman influence, but it would be interesting to explore that possibility further. Group H are the only swords that are not found in burials or rivers, but instead occur in multiple or single deposits.

Due to the high levels of corrosion and blistering present, it is not possible to identify edge-damage on the iron swords, but a number bear other forms of damage. Only 37% are complete, with the remaining 63% showing a range of what is probably post-depositional damage.

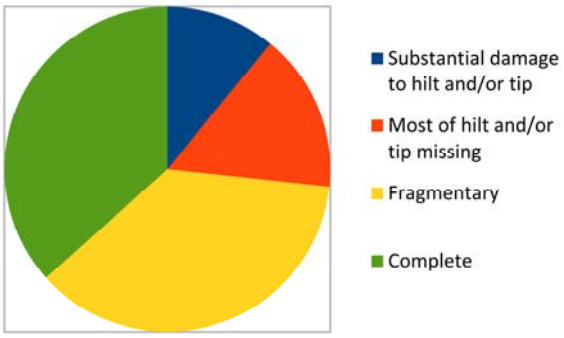

Illustration 4: Preservational status of IA swords of northern Britain

Further, 56% of the blades are broken, bent or both, and on 21% of the total number of swords there does seem to be purposeful damage (using the same criteria as applied to the bronze material). Other than a slightly higher number of instances of combination damage, the proportions here are very similar to those seen in the LBA.

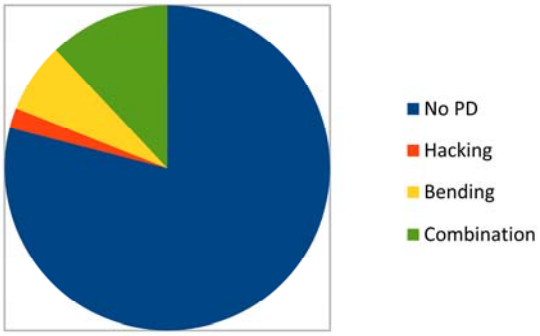

Illustration 5: Proportions of purposeful damage types on IA swords of northern Britain

The proportion of iron swords with recorded find context or details of association is more than twice as much as those from the LBA, at a total of 74%, 100% of these with a context and 86% with associations.

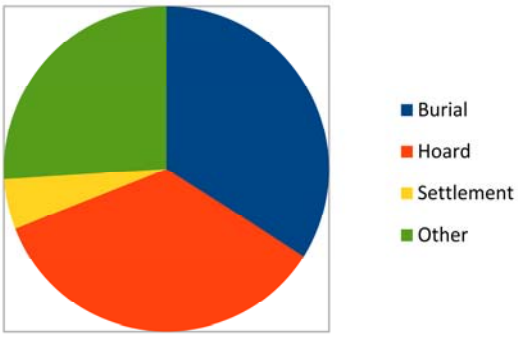

Illustration 6: Contexts of IA swords of northern Britain

At least 19% of the swords still show some visible decoration, usually in the form of enamelling, dotting or spiralling on the hilt, or ornate bronzework forming part of the hilt or scabbard. Given that more than 40% of the swords no longer have an associated scabbard and very few have any significant part of the hilt remaining, it is quite possible that such decoration was far more common than the numbers here would suggest. Although a number of swords from Southern Britain and the Continent bear what are thought to be armourer's stamps on the blade near the hilt (Stead, 2006: 48), none of the examples from northern Britain are known to have one. However, given that several are of necessity still kept in their scabbards and the blades of others are obscured by the products of corrosion, a research project to x-ray the northern British examples to identify potential stamps could be very interesting.

3.2.6 Iron swords in context

The development of swords in the north and south of Britain occurred essentially independently of each other. Numbers, state of preservation, suspension loop arrangements, decoration and depositional context vary significantly between the two areas until the 1st century AD, when one area adopted certain features of the other and vice versa, possibly as a result of, or response to, the Roman activity in each particular area. In addition, there are possible usage parallels between the Group G swords and their continental counterparts.

As with the bronze swords, considerably greater numbers of these weapons are

found in the south than in the north. Stead notes 211 swords, sword fragments and scabbard fittings from southern Britain, whilst the total number of comparable, extant artefacts from northern Britain total only 73. The southern swords are longer, often in better condition and have more surface surviving, which suggests possible differences in either depositional practice or quality of manufacture. The southern examples are also more variable in style, falling into one of ten categories, rather than the five categories found in northern Britain.

The suspension arrangements differ significantly in the north and south; the southern scabbards have loop plates attached to the back plate near the mouth of the scabbard, enabling the sword to be worn on a belt around the waist. In the north, earlier loop plates are short and symmetrical and the later ones extend the full length of the scabbard, but the majority of both kinds are placed roughly at the centre of the scabbard, so that the sword would be worn slung behind the back and drawn over the shoulder of the wearer. Such an arrangement is illustrated by the majority of the chalk figurines found in Yorkshire that are contemporary with the Group F and H swords; two show the sword worn at the waist, which was common in the south and on the Continent, but the other ten are worn on the back (Stead, 1988: 13-19; Stead, 2006: 63). None of the southern-style loops are found in the north, and only one sword from the south has the northern-style loops. In terms of the decoration for Group E swords, these include waves, tendrils, infilled lobes and hatched triangles which are similar to examples in Ireland but there are no comparable types on the continent. Many of the later Group F swords are undecorated; some show similar motifs to the earlier swords, but in a form that is similar to Group C scabbards from southern Britain. Such decoration may be of more significance than as a random, passive, and aesthetically pleasing pattern, or even as a representative of something else. Joy (2008: 94) posits (originally in relation to mirrors) that IA decorative designs on metalwork were intended to re-emphasise and reinforce the primary function of the object; the decoration therefore represents the essential qualities of the thing on which it is placed. This would suggest that decoration on scabbards and hilts (and in some cases on the blades themselves) should be considered as more than a stage of art form development, and that their re-examination, particularly in relation to decoration

styles on other weapons and other object types could be an interesting avenue of investigation.

Like the difference in depositional context for swords between northern and southern Britain in the LBA, there are again differences in context to be seen in the IA. The chart below was developed from Stead's discussion of northern and southern British contexts (2006: 80-81) and uses his descriptive terms ('Deliberate Deposits' is the term used to denote hoards). It shows the percentage distributions of depositional contexts of the 222 southern and 51 northern swords with a provenance:

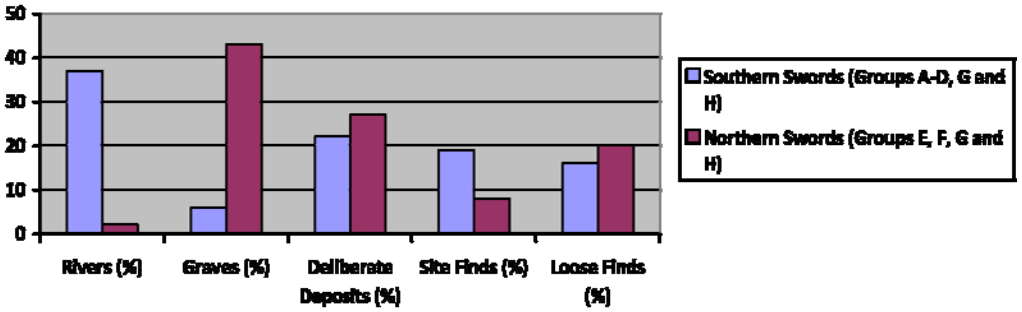

Illustration 7: Contexts of IA swords of Britain, using descriptors taken from Stead (2006: 80-81)

Clearly the preference for water deposition in the south and grave deposition in the north are the key differences here, although in the case of datasets as small as these, even small numbers of artefacts can suggest a strength of trend that is not necessarily existent.

Until the 1st century AD the key features of the northern and southern swords were distinct, but roughly at the time of the initial Roman incursions into each area, some of these separate features began to be seen outwith the area of their initial development. Types viii and ix, traditionally northern Group F features, are seen in the south, while cast copper alloy scabbard mouths, traditionally southern Group D features, are now found in the north, two in association with an entirely new chape style (Stead, 2006: 75-77). Rather earlier than the development of this stylistic connection is a practical link between the Group G swords and the

Continent. Although only two have been found in northern Britain, both were probably buried deliberately and one was found in a grave with the only long sword found northern Britain (now no longer extant), the latter circumstance mirroring practice on the continent, leading Stead to suggest that anthropoid swords were possibly subsidiary weapons to longer swords (2006: 72).

3.3 Northern British spearheads

3.3.1 Spearhead form and function

At its most basic, a spearhead consists of a blade and a socket, the latter used to attach a shaft in order to increase the length of the weapon. Within this definition, spears are very variable in form and function and are traditionally divided (in terms of their morphology and presumed function) into three types. Throwing spears are the lightest and smallest type, intended, as the name implies, only for throwing, and may for this reason have been carried in multiples. Thrusting spears are larger, but can still be wielded in one hand, using a shield in the other. Finally, heavy lances are similar to thrusting spears but have a longer blade, providing a more effective cutting edge. These would have been used two-handed, under-arm for cutting and thrusting, either without a shield or within a shield wall formation whereby the front rank carries the shield and the weapons are wielded by the second rank. However, spearheads rarely fall neatly into one of these categories, since the vast majority lie along a continuum between the three. In addition to overall size, perhaps the most important variable aspect is the shape of the blade – whether sinuous or angular - although further variables include base shape, individual lengths of socket and blade, junction thickness, midrib and point morphology. See Fig. 5 for a diagram of various spear features.

As with the swords, purely using morphology to determine function is unrealistic (see Chapter 7) and an examination of use-wear should be the preferred option where possible. Preservational issues dictate that evidence of use-wear is only visible on the LBA spearheads, as the iron examples are too corroded. However, where it is possible, the location of the damage may well be informative;

consequently, for analytical purposes the spearblade was divided into the upper portion (the 50% of the blade from the tip to the middle) and the lower portion (the 50% of the blade from the junction to the middle).

3.3.2 Bronze spearhead database

A number of typologies have been developed to classify the bronze spearheads of Britain, each successive method designed to ameliorate problems with earlier typologies relating to developmental hypothesis and chronology (Greenwell & Brewis, 1909; Rowlands 1976; Coles, 1960; Ehrenberg, 1977; Davis, 2006). These classifications, which are discussed in more detail in Chapter 5, mesh together relatively well and it has been possible to incorporate them into a single classificatory system for this thesis (which for ease of use will subsequently be referred to as the Anderson classification), enabling shorthand description which directly references prior work. Those types found in northern Britain are detailed below, together with their chronology and the numbers in which they have been found. Of the 216 spears in the database, 83 (38%) were able to be examined.

Anderson Classification	**Previous Classification**	**Numbers**	**% of Classified Weapons**	**Date (BC)**
1	IIIa / basal looped / E / triangular	1	1	1520 – 1040
2	IIIa / basal looped / E / narrow channel	3	3	1520 – 1040
3	IIIa / basal looped / E / Scottish variant a	9	9	1520 – 1040
4	IIIa / basal looped / E / Scottish variant b	0	0	1520 – 1040
5	IVb / protected loop / F / ribless / flat leaf	10	11	1310 - 840
6	Va / riveted / leaf with wings on either side of midrib socket	5	5	1310 - 840
7	Vb / riveted / hollow head	13	14	Unknown
8	V / riveted / leaf	51	54	1310 - 840
9	Vi / barbed	3	3	Unknown
Unclassified	Unclassified	128	----	----

Table 4: LBA spearheads of northern Britain

As some of the names of the typological groupings suggest, classification here is based on blade shape, the existence of loops or rivets and their location, size, midrib style and extent of the shaft hollow. Interestingly, Davis more subjectively also takes into account the skill of the workmanship involved and how good the 'finish' is.

It is unfortunate that the date ranges associated with this classification system are so large that their use merely splits the dataset into earlier and later groups, but a more nuanced analysis based on chronology is impossible using the current data. Groups 7 and 9 are not clearly dateable using the classification systems suggested by the authors mentioned above. However, they all - explicitly or implicitly - suggest a Montelian chronological order in their arrangements, making it likely that groups 7 and 9 can be dated to 1,310BC – 840BC.

Like the contemporary swords, the majority of the LBA spears do not display a high degree of morphological variety. Of those whose blade morphology can be identified, 68% are leaf-, or lanceolate-, shaped (the two terms are sometimes used interchangeably but for the sake of continuity they will be referred to as leaf-shaped in this thesis); perhaps the most multi-functional morphology, this form is equally useful for throwing, thrusting and slashing. Other forms seen in this period include flame (17%), ogival (5%), barbed (2%), kite (3%) and triangular (3%); at least as much as size, blade shape affects how, and against what, the spear will be used. Small spearheads or those with narrow blades are suitable for throwing, larger spears and those where the lower area of the blade is broad are suitable for thrusting, while those with either long blades or where the ratio of blade width to blade length is small are good for slashing.

Of the 83 spears in the database examined first hand, 69% have edges sufficiently preserved to enable them to be examined for edge damage. Of these, at least 40% are edge hardened and 27% show some form of use damage – in the form of notching, nicking, bowing, tearing, scoring or chipping. Other than edge-damage from some form of combat use, only 3 weapons (4%) appear to have been the

subject of purposeful pre-depositional damage – one by hacking and two by a combination of forms.

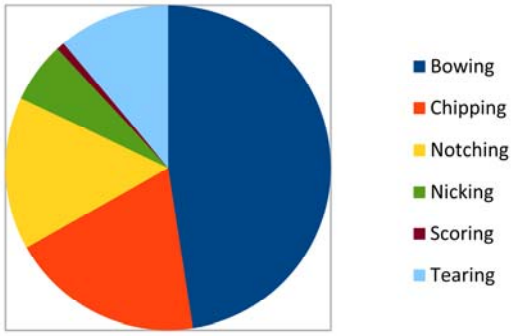

Illustration 8: Proportion of edge damage types on LBA spearheads of northern Britain

A total of 121 (55%) of the spears have a recorded find context or details of associations, (of those, 100% have a context, while associations are recorded for 93%).

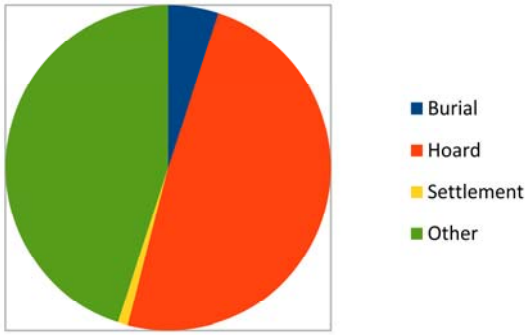

Illustration 9: Contexts of LBA spearheads of northern Britain

Decoration, while more common than on the swords, is still limited to relatively few examples. Of the 22% exhibiting it, such decoration involved making the cast itself more elaborate by casting channels or lines alongside the midrib for emphasis or casting a ridge along the top of the midrib. The lines or channels next to the midrib occur in all examples showing decoration, although the ridge on the midrib is rare. As with swords, it seems quite possible that spears could have been decorated in a way which has left no trace of its existence. Decorating spearshafts or the area where the shaft meets the spear with feathers, cloth, leather bindings, carvings and so on, is well-attested in historic and ethnographic records (Wiessner, 1983: 265), but the organic nature of such decoration would make its original

existence invisible in the archaeological record.

Unfortunately, despite a number of authors working on typologies of the LBA spearheads of Britain, a detailed catalogue and integrated study of these weapons has yet to occur – although a *Prähistoriche Bronzefunde* volume is planned. Lacking the specific information that would be contained in such a volume, it is not easy to place the material from northern Britain into its wider context. However, the fact that the classificatory systems mentioned above indicate both a degree of similarity, and also distinct differences between, northern and southern material, suggest that the northern British spearheads again seem to be neither entirely insular in development, nor entirely owing their development to southern and Continental examples.

3.3.3 Iron spearhead database

The research situation of the iron spearheads of Britain as a whole is extraordinarily inadequate. Unlike the LBA spearheads, which have an established typology and chronology, the iron spearheads remain a largely unexamined mass of material. The iron spearheads of other cultures or relatively close geographic areas have occasionally been considered; for instance, Swanton (1974) created a catalogue and typology of the Anglo-Saxon spearheads of England, a number of authors have discussed the Roman spearheads found in Britain (Brailsford, 1962; Barker, 1975; Densem, 1976; Scott, 1980; Manning, 1985; Marchant, 1990), Ilkjær (2002) has produced an overview of the Illerup Ådal material, and a catalogue and basic typology of the Gournay sur Aronde spearheads has been published (Brunaux & Rapin, 1988). Although Stead (1991a: 33, 75) does briefly discuss a small proportion of the indigenous IA spearheads (see section 2.2.2), these are from a limited group in terms of geography, chronology and context. A full catalogue or discussion of the native spearheads of IA Britain, or EHP northern Britain, is sorely lacking. Consequently, all discussion of this group has only the research connected to this thesis to draw upon as source material. In addition, the problems associated with dating the swords apply equally to the spearheads; it is therefore not possible to write separate sections on IA and EHP spearheads, as at present they are essentially undifferentiated.

120 iron spearheads are recorded from northern Britain, the preservation of which is similar to that of the iron swords, all exhibiting a high degree of corrosion and blistering which can make ascertaining the original outline shape and proportions of the spearhead difficult. 11 are too fragmented to be certain of their original shape, but the remaining 109 fall into a similar, but slightly expanded, range of forms to the LBA examples; however, the iron spearheads are far less complex or variable within their range of morphological outlines. Unfortunately, there is a noticeable lack of uniformity, accuracy and detail across published descriptions when discussing spear blade shape. Describing the form of an individual spearblade can also be very subjective, particularly where the artefacts frequently lie on a continuum rather than presenting distinct shapes. This can have a considerable impact on the ability to compare and contrast research by different authors, as well as being one of the limiting factors in tracing the design origins of indigenous iron spearheads. Consequently, it is vital to be able to convey the range of spear morphologies with the minimum of ambiguity.

In terms of morphology, the spearheads can be initially divided into two groups, depending on whether their blade edges are straight or sinuous, before being placed in subgroups depending on location of the widest part and the type of curvature, or otherwise, of the blade edge:

Blade Group	**Blade Sub-Group**	**Description**
Sinuous (67%)	Leaf (53%)	Blade edges are convex
	Flame (21%)	Blade edges are concave or straight
	Ogival (2%)	Blade edges are concave or straight with a secondary level of widening towards the tip
Angular (33%)	Triangular (5%)	Widest point of blade lies at the junction
	Diamond (7%)	Widest point of the blade lies halfway between junction and tip
	Kite (19%)	The proportion of the blade above and below the widest point is not equal

	Pyramidal (2%)	Three, rather than two, blade faces

Table 5: Morphology of IA spearheads of northern Britain

Within these groupings, there can be huge variation, given that the size and proportion of each item is not taken into account in the classification, in addition to the occasional example which does not quite fit neatly into any group; this, however, is an issue to be resolved in chapter 6, with the development of an appropriate classification system or typology. Although poor preservation of some artefacts will ensure a measure of subjectivity when deciding which form is applicable, transparent form meanings will hopefully introduce a degree of continuity with subsequent work.

Proportionately, this spread of morphological types is roughly similar to that seen in the LBA, with two differences. Firstly, the morphological types are slightly different in the IA, with no barbed examples being seen but two new groups (Diamond and Pyramidal) developing. Were the numbers involved larger, one might surmise a slightly greater degree of specialisation of use, but insufficient data would limit the reliability of such a conclusion. Secondly, the proportion of leaf spears is somewhat decreased, from 68% to 49%, which may be a reflection of the wider range of morphologies or again, may indicate more specialisation in terms of function. One other difference between the LBA and IA spears are the sizes involved. The histogram plotting LBA and IA length and width measurements suggest a clear trend for decreasing size between the two periods (albeit with a number of outliers during the IA).

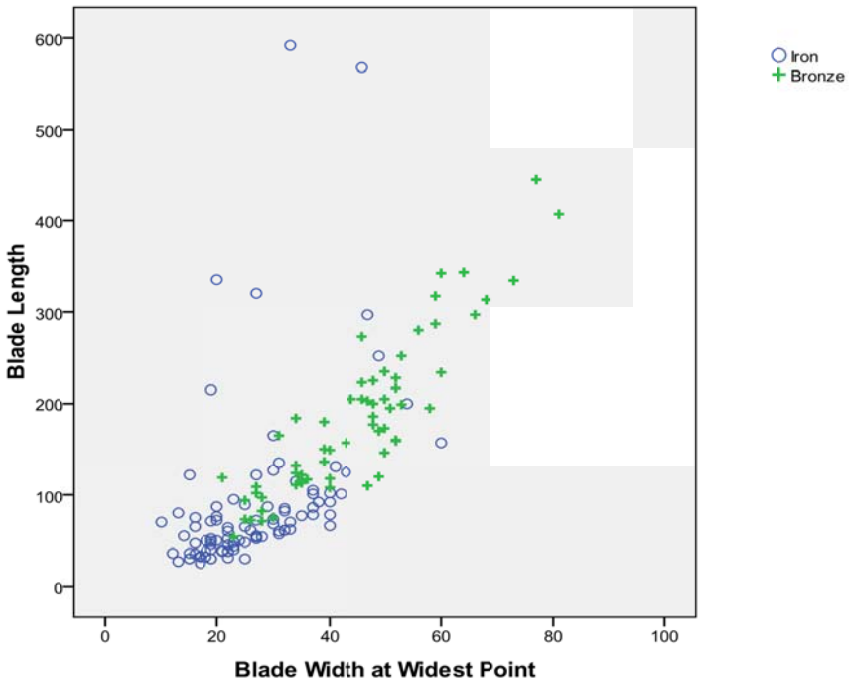

Illustration 10: Length against width of LBA and IA spearheads of northern Britain

Despite a lack of an existing typology or chronology to draw upon, 79 of the extant spearheads can be roughly dated through association, context, published (but often unexplained) dates or occasional radiocarbon dating of shaft remains. Without some level of validation, either by establishing a typology or a programme of radiocarbon testing, the great majority of these dates are speculative, and may even be misleading, but there are two reasons for their inclusion here. Firstly, taken together they can provide a rough picture of date range spread that can subsequently be compared with any typological groupings that might be developed. Secondly, without some means of placing the material into an initial chronology it is not possible to view it in context of the admittedly limited information available on other iron spearhead populations in Britain.

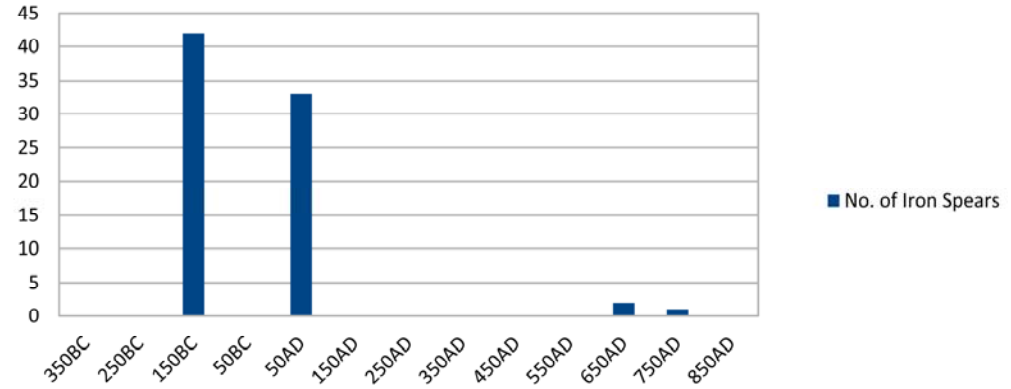

Illustration 11: Associated dates of IA spearheads of northern Britain

Accepting these dates unproblematically, the majority of spears fall within the middle of the IA (although 3 spearheads are securely dated to the EHP) and there is a chronologically limited spread of weapons across the period. Unfortunately, it is not simply the 'dates' associated with the iron spearheads that may provide a misleading picture of spread and chronology. The majority of all the spears (78%) were found in sites or assemblages that produced six or more spearheads – 33 are from the South Cave cache alone. Where a range of dates can be assigned to such assemblages, the relative numbers involved lead to a distorted view of the overall spread of material across a time period.

The preservational status of the iron spearheads prevents a comprehensive analysis of damage, purposeful, accidental or otherwise; although some examples are intact enough to provide such data, the majority must be discounted from any meaningful analysis. 42% of the examined spears are complete, while the remaining 58% show a range of probable post-depositional damage:

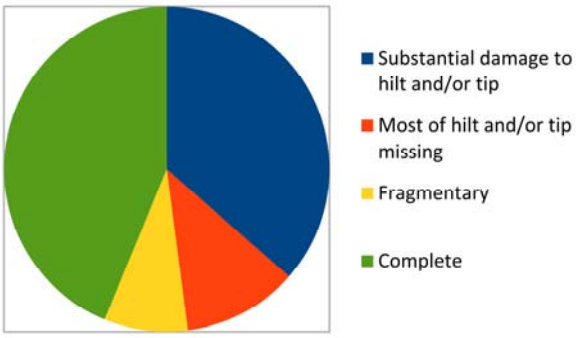

Illustration 12: Preservational status of IA swords of northern Britain

Further, although 38% of the spears are broken, bent or both, only 3% of the total number show purposeful damage (using the same criteria as applied to the bronze material). Other than a slightly higher number of instances of combination damage, the proportions here are very similar to those seen in the LBA.

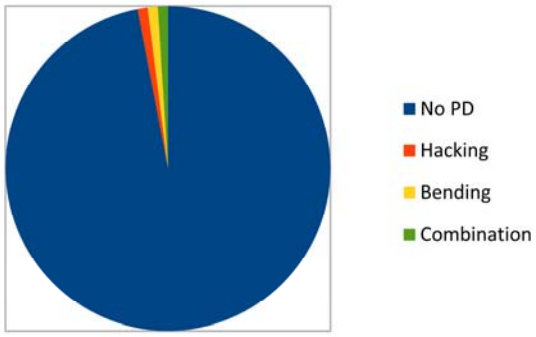

Illustration 13: Proportion of purposeful damage on IA swords of northern Britain

The proportion of iron spearheads with a context or details of association is high, at 97%, 100% of which have a context and 87% of which have associations. The simple explanation for this spike in numbers is that a large proportion are found in burials or hoards where numerous spears have been found in association with a few other objects.

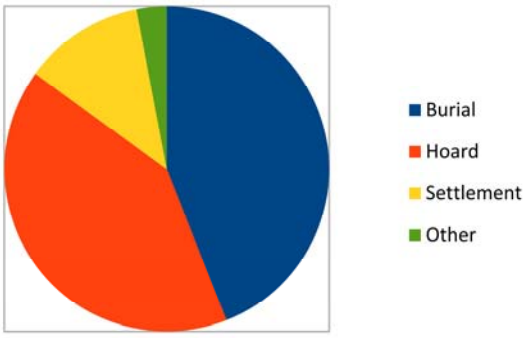

Illustration 14: Contexts of IA swords of northern Britain

The spearheads lack the capacity for decoration provided by the associated metalwork of hilts and scabbards (although the occasionally a bronze rivet has been used), and none appear to have been decorated during the manufacturing process through the use of punches or incising (although as noted in section 3.2.5, a wider programme of X-rays might reveal some examples). Only one spear, from South Cave, shows any form of decoration – in the form of a small bronze attachment to the base of the socket. Given the emphasis on decoration associated with the contemporary swords, it seems likely that some form of decoration could have originally been extant, but that decoration (whether organic or on the metal itself) has long since decayed or been obscured by products of corrosion.

3.3.4 Iron spearheads in context

The lack of published material makes comparison of the northern and southern spearheads of Britain in the pre-Roman IA impossible, and severely limits comparisons with the continent. Consequently, the northern British material can be viewed only in context of the finds from Gournay and Illerup Ådal, and the Roman and Anglo-Saxon material.

In terms of continuity within northern Britain, the IA spearheads generally do show a similar range of morphologies to the LBA but are, as mentioned, somewhat smaller. There do not appear to be parallels in terms of style between the earliest iron spearheads and the latest bronze spearheads, which is not necessarily surprising since there is a gap of several hundred years between dates of the latest bronze and earliest iron spearheads. Rather than an entire absence of weaponry

during the EIA, it appears that a number of weapons were instead being manufactured of stone or bone (see section 8.2.3), whose morphology was necessarily constrained by their material, rather than directed by cultural choice.

Other than Stead's (1991a) mention of east Yorkshire spearheads, published material on iron spearheads is scarce for the IA, but the reports on the spearheads from Gournay sur Aronde, in modern France, and Illerup Ådal, in modern Denmark, are an exception. Gournay was an IA sanctuary that was used between the 4th and 1st centuries BC, before being burned and levelled; during use, it was the repository of a huge range of weapons, shields and human bones, most of which were deliberately and catastrophically damaged at the time of deposition. The different types, range in quality and evidence of use and repair suggest that these were functional weapons which had been used in combat (Brunaux & Rapin, 1988: 240-241). The Illerup weapons were excavated from what is believed to once have been a sacrificial lake, used between at least AD 200 and AD 350, and were also subject to considerable damage at the time of their deposition (Ilkjær, 2002: 8, 35-36). To an extent, the Gournay spearheads show some stylistic overlap with some of the visual- and Two Step Clustering-based groupings discussed in Chapter 6; specifically, Gournay type Ia roughly equates to Group 2/II, type IIIb to Group 3/II and type IVb is strikingly similar in form to the one South Cave spear (ISP183) that could not be placed in any of the visual groups and remained in the Miscellaneous Group until its TSC-based placement in Group IV. In contrast, the majority of the Illerup spear types do not bear any resemblance to the northern British examples; the only possible exceptions are that ISP115 and ISP177 (both from South Cave) partially resemble the Vøien speartype from Illerup, although neither blade outline or midrib are as distinctive on the British spearheads. It is unlikely that these similarities indicate connected stylistic developments between northern Britain and these areas for two reasons. Firstly, the Gournay material is substantially earlier, and the Illerupe material substantially later, than the northern British spearheads (see Illustration 11). Secondly, although both the Illerup and Gournay material are deemed to have been taken as spoils of war from enemy combatants over a period of time (Brunaux & Rapin, 1988: 241; Ilkjær, 2002: 14), a working typochronology has

been able to be applied to each group. Given the range of areas these 'enemy combatants' may have originated from, this suggests that some forms of spearhead were very generic and found across wide areas – a point also made by Ilkjær (2002: 67). The widespread distribution of particular forms, and very short periods of functional use lasting only 30-50 years (Brunaux & Rapin, 1988: 132; Ilkjær, 2002: 43), of continental spearheads suggest that finding meaningful stylistic connections between the very small group of northern British spearheads is remote. Identifying such connections between that population and continental populations considerably earlier or later in date would be even more unlikely. The only exception here is ISP183, whose form very closely mirrors that of Gournay type Ivb (see Fig. 9). Although form IVb dates to the 2nd century BC and the South Cave spearheads to the 1st century AD, the morphology is sufficiently rare and unique for the similarity seen here to be considered an unlikely coincidence.

Although the few typologies for iron spearheads on the continent have proved largely unrelated to the northern British material, the approach taken by their authors to functional divisions of spearheads is interesting. Brunaux & Rapin (1988: 240) believed that the range of morphologies of the Gournay spearheads suggested both light and heavy infantry, and cavalry. Ilkjær (2002: 42-43) divides spears into throwing (with barbs) and throwing-and-thrusting (without barbs) weapons, and also categorically states the existence of different strata (including cavalry) within the social groups represented by the totality of the Illerup finds (2002: 113, 124). However, the implication of his spearhead typology is that each spear form was successive to the last one, which suggests that a range of spear-types designed for different functions were *not* being used at the same time. These are both large populations consisting of solely military equipment, and therefore the smaller population from a range of contexts from northern Britain makes direct comparison difficult. Nevertheless, the visual groupings of spearheads suggested in 5.2.2 do indicate a sufficiently variable morphology that functional use must have been a consideration in manufacture. Further discussion of the links between morphology and function takes place in chapter 5.

Returning to Britain, the northern British kite forms and a number of leaf or elongated leaf spearheads have parallels with both some of the Roman material and classes C1, D1, D3 and K2 of the Anglo-Saxon material (Marchant, 1991; Swanton, 1974). Again, the presence of such spearheads is unsurprising given their versatility and ubiquitous nature, and for the same reason similarities involving leaf-shapes between the northern British material and other spearhead populations are not necessarily indicators of contact or influence. Until there is adequate published material, indicating reliable date ranges and geographically specific locations of manufacture, it is not possible to do more than note which forms of spears appear to be cross-continentally and chronologically ubiquitous, and which appear to be stylistic anomalies.

3.4 Northern British shields

Shields can be discussed in the context of weaponry, rather than armour, since their use is active during combat; as with the swords and spears, they can be used offensively and defensively in a range of motions, and their effectiveness is dependent both on the skill with which they are wielded, as well as their innate properties. The shields of the LBA were made with both organic and inorganic materials (or occasionally a combination), and while the shields were all circular they varied widely in size, construction and design, all of which are linked to functionality. They will determine both how the shield should be used, and what weapons it should be used with and against.

Northern Britain has so far yielded eleven shields or parts of shields dating to the LBA, sadly only six of which are extant; four of the five Lugtonridge Farm shields and the Broomey-Holme shield are apparently untraceable. Coles (1962) classifies eight as Yetholm types, one as an Eynsham type, one as a Coveney type and one as Harlech type. The Yetholm types are large, typically 45-70cm in diameter, with concentric rows of small bosses that alternate with ribs, and are very similar to the Harlech type, except that the latter has only ribs and no bosses. The Coveney type consists of a number of ‘meandering’ ribs (in this case, four) set between two concentric ribs and is somewhat smaller than the Yetholm and Harlech types. Finally, the Eynsham type is by far the smallest form of shield, measuring between

19 and 35 centimetres in diameter, and consists of the central boss and handle which is surrounded by one or two rows of bosses and one rib.

Over the previous five decades, there has been some disagreement over the functionality of bronze shields in combat conditions, although the most recent research has found that they could be (and almost certainly were) used very effectively (see chapter 4). Several southern examples bear evidence of some form of damage, although the only northern example is the Beith shield. The interpretation of metal shields as votive offerings has led to such damage being considered the result of ritualistic activity prior to deposition, and some damage may well have been inflicted for this reason. However, their possible inclusion in combat functional panoplies suggest a re-examination of such damage for its possible causes could be beneficial. The large size of the majority of shields suggest that a particular style of fighting that involved a very active use of the shield was the norm, but that smaller, buckler-type shields, requiring extreme precision and control during combat, were also in use. However, it is worth noting that the number of artefacts in the dataset is so small here that it is not possible to draw firm conclusions regarding normative practice based on them.

Interestingly, the depositional context for the shields moves away from the burials that dominate those for the other weapons and appears to be firmly related to ritualistic activity. Of the original 11, 9 were found in multiples, while only one shield, from Criagdarroch, was said to be found in a burial. Of the remainder with recorded contexts, all were found in peat, sometimes in unusual depositional arrangements – the five original Beith shields were said to be found placed on edge in a ring, while the two Auchmaleddie shields were placed on top of each other. Unfortunately, all the LBA shields were found or presented to museums in the 19th century and the records on their contexts and associations are therefore possibly incomplete or unreliable.

Coles posits that apparent Urnfield and Hallstatt influences on the design of some of the British series of shields, and similarities with certain types of continental shields (particularly the Nipperweise type), would date the British material to the

8th century BC onwards (Coles, 1962). Although somewhat late, accepting such a date would suggest that these shields were being produced at roughly the same period as the marked increase in production of swords and spears. Prior to this period, it is not unreasonable to suppose that organic shields may have been in use; two wooden and one leather shield have been found in Irish bogs, in addition to two wooden shield shapers (Uckelmann, 2011: 187). Uckelmann also believes that wooden and leather shields may have widespread across the continent, although the evidence for such remains indirect (pers.comm.). The similarities between the elements of the weapons panoplies in northern Britain and those of Ireland and the continent would suggest that organic shields may well have been in use in northern Britain as well.

The evidence for shields in the IA and EHP is considerably (and literally) more fragmented. During this time, shields appear to have been made of wood with metal fittings, and it is only these latter parts which have survived; in northern Britain, only 11 shield fittings, fragments or bosses can be attributed to the IA, and none to the EHP. Despite a lack of EHP examples, there is iconographic evidence of their existence and style, which suggests slightly smaller shields than was common in the LBA, in circular, square or H-shaped form (Allen & Anderson, 1903). Find contexts are attributed to 8 of the IA shield fittings, all of which are associated with burials, the majority apparently of high status and containing numerous other objects. The small number of finds, and the partial nature of the evidence they provide regarding shields as a whole has prevented the development of any form of classification for this group.

3.5 Armour

The intention of armour, which includes helmets, gauntlets, breastplates, chainmail and shin greaves, is to protect the most vulnerable parts of the body, while allowing the wearer to continue to make effective strikes. Armour is thus of both practical benefit and detriment to the wearer, a balance needing to be achieved between protection and manoeuvrability. It is possible that some form of armour was in use during the periods under discussion, but the only evidence of such from northern Britain are the examples of chainmail found in Yorkshire, at

Kirkburn and Stanwick, and at Carlingwark Loch, and the iconographic evidence of helmets from stones such as Aberlemno 2. Quite possibly strengthened leather armour was in use during the IA and earlier, which evidently would not have survived, but the lack of bronze examples in the Atlantic zone generally is interesting. While leather armour is certainly effective, bronze armour appears to have been in widespread use in other areas of the world in which a warrior culture prevailed during the BA, notably areas of Greece, and could be as much of a status indicator as the use of a war chariot or elaborate sword (Snodgrass, 1964). Further, given the quality and size of some of the metal shields from northern Britain it is quite clear that the problem was not a lack of skill or scarcity of metal, but probably lay in cultural practice.

3.6 Chapter discussion

A recurrent research problem throughout this chapter is the lack of published work on certain artefact groups. LBA swords from Britain, Ireland and the Continent have the best associated sources, and are dealt with by numerous authors, such as Colquhoun & Burgess: 1988, Eogan: 1965 and Molloy: 2006. Similarly, although works on iron swords are rarer, Stead's 2006 volume in particular allows analysis of the material itself, examination of the catalogue and comparison with weapons from wider Europe. The spearheads fare less well; although the LBA spearheads are partially well-documented, in that working typologies exist for the British material, crucially there is no catalogue. In contrast, although the iron spearheads of Britain as a whole have no associated typology or catalogue, there are catalogues, typologies and general works on particular spearhead populations, be they from sites (Hod Hill) or associated with cultural groups (the Anglo-Saxon spearheads). The cumulative effect is that often some detective work was required to identify the material relevant to this study, and that particularly for the spearheads, discussing them in the context of wider trends in Europe is not possible without considerable further work, the most pressing task of which is the creation of adequate catalogues that are less site or culture specific in focus and cover entire geographic areas and time periods.

Returning to the material contained in the database, an issue that becomes clear

when examining the weapons of northern Britain are the chronological variation shown, both in terms of the numbers of weapons that have been found and the preservational status of those weapons: there are relatively high numbers of weapons found that date to the LBA and these are generally very well preserved, but the material from the IA is smaller in volume, restricted to the LIA and more poorly preserved, preventing some of the avenues of investigation possible with the bronze material. The situation deteriorates further in the EHP where there appear to be extraordinarily few physical examples of weapons – although iconographic evidence becomes available from this period, allowing comparative study between the EHP and earlier periods, despite the lack of material. Clearly the poor preservation of the later material is almost entirely due to the change in metal, but the reduction in quantity over time is due to more complex factors. Firstly, many iron weapons will certainly have disintegrated so completely that no trace of them is left. Secondly, the parlous state of dating and typologies for much of the iron material has meant that the majority of objects have been, of necessity, classified as IA until certainly proven to be EHP; for this reason, there are probably a number of artefacts that should be removed from the IA bracket and placed with the other EHP objects. Thirdly, depositional practice in the LBA was widespread and varied, including the deposition of high quantities of varied material, frequently in watery contexts that provided a level of protection. The narrowing of such practice mainly to burials in the IA and beyond has limited the numbers that survived. Finally, it is possible that, from a peak in the LBA, weapon production simply declined for roughly a millennium; however, this latter theory has little evidence to support it other than the plain numbers of weapon finds involved, which are clearly fundamentally biased.

The effect on this research of the variation between the elements of the database is profound, with particular research approaches possible only for one period or another; consequently, the following three chapters are a direct response to the nature of the database. Chapter 4 seeks to exploit the numbers and preservation of the LBA weapons; the visibility of edge damage on many weapons suggest they were used in combat activities – a theory which can be tested using experimental methods. The principal goal of this chapter seeks to gain a greater understanding

of the functionality of the full weapons panoply and in particular the spears, which are underrepresented in existing research on the topic. The key research problem of the IA material as a whole, as a direct result of the minimal numbers and poor preservation involved, is the inability to include the spearheads in any overall analysis due to the lack of a typological framework. Chapter 5 applies a range of typological approaches to the whole population of iron spearheads with the goal of creating a *first step* in the typological process; the results are not definitive, but intended as a basic platform which subsequent research can improve and build on. A secondary goal of the process was the possibility of separating out more reliably the EH spearheads from the general mass, given that the key issue with the EH panoply as a whole is its absence. The reasons for this absence have been discussed, but the lack of physical evidence proves a major obstacle in terms of tracing the development of warfare and conflict in northern Britain. As such, Chapter 6 is an exercise in drawing on multiple sources of evidence in order to ameliorate research problems associated with failures in parts of the archaeological record. As well as the absence of weapons, the EHP is notable for the presence of iconographic, textual and settlement sources, which combined are illuminating on the topic of warfare. Once the opportunities of the database have been exploited, and the limitations addressed, Chapter 7 returns to the information contained within it to specifically analyse its contents and grasp what can be discovered, or not discovered, on the topics of the weapons themselves (in terms of life cycles, form, function and general usage) and warfare itself (for example, what the term actually means in this context, whether gender roles apply and what the role in society of warfare and the warrior might have been).

Chapter 4: Experimental Trials of Bronze Weapons

Preservation of the bronze weapons was such that a total of 39% of the total examined weapons showed some form of edge damage. It was therefore of interest to discover whether this damage was the result of combat behaviours, and in what ways spears, shields and swords might be used to replicate such damage. In addition, experiential evidence might suggest the most effective and ineffective modes of use. Thanks to extremely generous funding from Sagnlandet Lejre in Denmark and The Moray Endowment Fund in Scotland, a series of experimental trials of bronze weapons took place in Denmark in August, 2009.

4.1 Literature review

The majority of experimental work on the LBA weapons panoply thus far have focused on shields. In 1962 John Coles published a paper mainly concerned with the typological series of European BA shields and their manufacturing process. However, one page of the 34 page article was devoted to an experiment Coles designed in order to test the 'function' of British metal shields. Using replicas of a 'leaf-bladed bronze sword' and a 'ribbed shield of copper' some 0.3 mm thick, he found that a sword thrust easily penetrated the shield and a slashing blow nearly cut the shield in half. This stood in marked contrast to the effectiveness of replica leather shields. His conclusion was that bronze shields could only have been used in a ceremonial or display context and were not a functional part of a weapons panoply. However, these conclusions cannot be accepted unreservedly due to various weaknesses in both the methodology of the experiment and its publication. Although the findings of Coles experiment were widely publicised, the reporting of the details was extraordinarily scanty and contravened Cole's (1979) own guidelines, admittedly published seventeen years later, relating to record-keeping before and during experiments. There is little in the way of explicit explanation of the manufacturing process (one must assume he followed the general procedures outlined earlier in his paper), no information on the location of his hardness testing,

whether it took place before or after his experiments, the methodology of the experiment itself or specific details of the results. Despite this, the conclusions drawn as a result of the experiments remained widely unquestioned until 2006, when Dr. Barry Molloy's PhD thesis was accepted.

Molloy questioned Coles' results after running similar experiments using a leather shield, a copper shield 0.9mm thick (partially lined with sole-leather) and a 10% tin bronze shield 1.5mm thick; all three shields effectively withstood various strikes with very little damage. This thesis was never published, although the results were mentioned, briefly and without detail, in a subsequent book, *The Cutting Edge* (2007), and in more detail in *Antiquity* (2009).

Possible reasons for the disparity between Coles' and Molloy's results arise from four issues. Firstly, the presence or otherwise of strengthening ribs on the face of the shields will have a profound effect on their ability to maintain structural integrity; neither author mentions whether these ribs were employed on their experimental models but a difference in ribbing would be expected to affect the results. Secondly, the specific metallographic composition was different between all three metal shields that were tested. Copper is softer than bronze and despite Molloy's copper shield being thinner than his bronze one, it still remained relatively undamaged. Considered in conjunction with Coles' results, this suggests that metallographic composition is not as important as thickness, which is the third issue. Although both Coles and Molloy used shields for which there are parallels in the archaeological record, that used by Coles was unusually thin; the majority of European shields are 0.6-1.2mm thick and Coles' shield was 2-3 times thinner than the typical Yetholm type shield. The previous three factors could significantly affect the strength of a shield and have a very strong bearing on its ability to withstand attack. The final factor relates to the modes of attack used in each experiment. It is not known precisely how Coles conducted his experiments but photographic stills suggest that he used the shield to block sword strikes dead on, holding the flat of the shield directly in front of the body and absorbing the entire weight of the blow onto the face or edge of the shield. The experience of re-enactors and martial artists is that this is a profoundly ineffective defensive

technique, causing significant damage if the blow strikes to the rim. Instead, it is more efficient to use the shield to parry the blow away from the body, using the face of the shield obliquely. Molloy was well aware of this practical issue when he undertook his experiments and designed them accordingly. In order to compare fully two sets of results, the modes of attack and defence need to be considered. Molloy's results, if accepted, would require a major reappraisal of the role of bronze shields. Recognition of metal shields as part of a functional weapons panoply would affect considerations of the role of display, wealth and status in connection with warfare.

While Late Bronze Age spearheads have been thoroughly catalogued (e.g. Greenwell & Brewis 1908, Coles 1960, Bridgford 2000, Davis 2006), little detailed work has been conducted on their use. Most authors implicitly assume that spearhead use consisted of either thrusting or throwing, depending on spearhead morphology, although Laux (1971: 85), examining material from the Luneberg area of Germany, explicitly links use to size ratios. He concludes that spearheads whose blade constitutes ¾ to 5/6 of the total length are thrusting weapons on grounds of 'balance', while suggesting that those with a spear blade of less than ½ of the total length, which are often found with short swords, would have been used for throwing before close-quarters combat was joined. While less specific, Snodgrass (1964: 136-139) also cites the socket/blade ratio as a key indicator of use, given its effect on the balance of a thrown spear. Without further reasoning and discussion, this reasoning appears simplistic, and does not consider other measurements and ratios that will affect structural integrity and balance or the possibility of multi-functionality. A second relevant contribution to spear use comes from Molloy (2006: 30), who notes the possibility of hafting spearheads with a shorter shaft, making it possible to use them one-handed in the manner of a Zulu assegai. It should be noted that only six complete shafts associated with LBA European spears are known and of these, none are less than 1.43m in length (Hooper & O'Connor, 1976: 35-36). However, such a small dataset does not preclude shorter examples being utilised.

Despite the limitations of the work (see section 2.2.1), Bridgford's (2000)

identification of six distinct forms of edge/combat damage is valuable here as a framework within which to analyse the damage sustained by the spearheads during the experiments. Bridgford herself noted the presence of similar damage on the spearheads in her study, but attributed it to occasional, accidental parrying or pre-depositional ritual damage. However, such an explanation seems unlikely given the high proportion of such damage (31% of examined spearheads in this dataset) and the presence of edge hardening on 40%, which suggests that the spearheads were being manufactured with the possibility of sustaining edge damage in mind.

4.2 Aims of the experiments

The aim of these experiments was to gain a practical, functional understanding of how Late Bronze Age shields, swords and spears *could* be used. Recognising that it would be unlikely that specific combat techniques could be recreated, it is nevertheless important to understand the possible range of uses - what is effective, what is not, what is the most comfortable method of handling and so on.

Within this wide-ranging purpose were more specific aims, the first of which concerned the link between tip damage to the spearheads and their use as throwing or thrusting weapons. The few explicit discussions of spear use in the relevant literature are often binary in nature, in that spears are considered as throwing or thrusting weapons, or occasionally a multi-functional cross between the two. However, had they really been used in this way, one might expect to see a large proportion of the weapons showing point damage. Of the spearheads examined for this research, only 19% show such damage, the vast majority of these plainly a result of inaccurate casting, corrosion or post-depositional damage. Only 3% of the total dataset appear to show point damage as a result of use. Instead, 31% exhibited damage patterns identical to those identified by Bridgford on contemporary swords. The presence of such damage suggests that the lack of tip damage was not necessarily as a result of the inherent hardness of the spearheads. Consequently, the first aim of the experiments was to determine whether a series of throwing and thrusting strikes made by the spearheads onto leather and metal shields resulted in tip damage. Should this be the case, it would imply that the lack of such damage in the original dataset was the result of spears *not* being thrown or

thrust in this period.

The second aim, connected to the first, related to the style of use of the spears. The similarity of the spearhead edge damage to the sword edge damage suggests that the two weapons were being used in a similar manner, with the spearheads possibly mounted on a short shaft and used one-handed. The experiments provided an opportunity to test out this mode of use to see whether it would have been practical from a combat perspective and could recreate the damage patterns seen on the edges of the original spearheads. Positive results for this aspect of the experiment would necessitate a re-examination of fighting styles and military training and organisation in this period. Furthermore, it was of interest to determine whether a particular form of strike led to a particular form of damage type; should this be the case, it would permit very specific analysis of fighting styles, and possibly identify differences in these from a regional and chronological perspective.

The third aim considers the relative merits of leather and metal shields. Comparing the experiment design and results from the Coles and Molloy experiments, it seems likely that a shield with a high copper content that is 0.8mm thick would be functional during combat, where 'functionality' is defined as the ability to maintain rim structural integrity during the course of all the strikes sustained during the experiments. It is this degree of functionality of metal shields that the experiments were designed to determine. Additionally, although the results of previous experiments indicate that a leather shield will be likely to maintain structural rim integrity throughout the testing, it was of interest to note any differences in practical performance of the two shields further than simply rim strength.

4.3 Experiment preparations

4.3.1 Design approach

The purpose of these experiments was to provide evidence to support or reject the

hypotheses stated. Therefore, they were initially conceived and designed using the 'controlled' approach documented by Rasmussen (2007), and specific care was taken isolate and document as many variables as possible in order to pinpoint cause and effect. However, in a research project of this scope the benefits and value of including some aspects of a 'contextual' approach should not be underestimated. In addition to deliberately generating quantifiable and repeatable data from the experiments, subjective, experiential and unanticipated results were also documented in order to maximise the research value of the project.

4.3.2 Choice of material

Clearly the experiments needed replicas of spearheads in order to be conducted. There were two options when commissioning such pieces; either try to achieve a 'generic' item by finding and duplicating the average for the attributes of each spearhead (size, shape, metallographic composition etc) or to replicate a specific artefact. The latter option was chosen, as the variables possible for all the different spearheads were so many that creating a 'generic' spearhead would render its results meaningless. Although using a recreation of a specific artefact might limit the applicability of the results when considering weapons of substantially different morphologies or metallographic composition, they would at least be specific.

Having decided upon a re-creation, the next concern was which artefact to replicate. The item chosen would need to be as complete as possible in order to provide enough detail to work with, and would need to be locatable (frequently a problem with material from the database). A similar process needed to be undertaken to obtain the shields and sword for the experiments. In the case of the shields, the choices available were simple as there is a very small dataset on which to draw – only eleven LBA shields, or parts of shields, have been found in northern Britain, all of them metal. In contrast, there are 221 possible swords to choose from. The most common styles of sword and spear (Ewart Park 2 and Type 8, respectively), which are roughly contemporary, were chosen and efforts were made to draw each item from the same geographic area, ensuring the possibility that these were items that could potentially have been used in conjunction with or against each other. Given the requirement for the items to be whole and accessible,

only one area was possible – Region 2, specifically Aberdeenshire, from which spearhead BSP215 (origin: Blackmiddens, Rhynie, see Fig. 10), sword BSW233 (origin: Ythsie Farm, Tarves, see Fig. 11) and shield SH15 (origin: Moss of Auchmaleddie, New Deer – the smaller of the two found there, see Fig. 12) were chosen. In addition to the metal shield, an organic example was required to allow for a wider range of possible damage patterns to emerge. Unfortunately, no organic shield has yet been found in northern Britain; the few extant examples that could potentially be similar are those found in Ireland, where the weapons panoply and styles are relatively similar (Molloy, 2006). Of these, one of the most famous (and that used as a model by Molloy), the Clonbrin shield (see Fig. 13), was chosen for replication, although its current location in Dublin enabled only the most basic measurements and patterns to be copied. There was certainly less detail available than that used in the creation of the spearheads, sword and metal shield.

4.3.3 Details and manufacture of spears

All of the following spears, sword and shields were manufactured by Neil Burridge of Bronze Age Craft in Cornwall.

Thirty-three class V type spearheads were commissioned, modelled on the Blackmiddens spearhead, currently held at the National Museums of Scotland with the accession number DG97, using the following measurements:

Measurement	Length in mm
Blade length	132
Socket length	18
Width of blade at widest point	42
Distance of widest point from socket/blade junction	52
Socket diameter	22
Socket thickness	3
Width of socket/blade junction	21

Table 6: Measurements of experimental spearheads

These were sand-cast, with a metallographic content of 90% copper, 9% tin and 1% lead. Once cast, the edges were annealed twice and edge hardened. The final weight of each spearhead was 190g. The shafts used were of seasoned ash, either

approximately 150cm long or 78cm long, whittled to a point at one end to enable ease of insertion into the spear of up to around 30mm. Once the spearhead was pushed firmly onto the shaft and the shaft butt was tapped on the ground, the spearhead was held quite firmly in place, although a small metal tack was also driven through the rivet hole into the shaft to ensure the spearhead was held on securely. No ferrules were used.

4.3.4 Details and manufacture of sword

One Ewart Park 2 type sword was commissioned, modelled on that found at Ythsie Farm, Tarves, Aberdeenshire, currently held in the British Museum with the accession number 1858 11-15 1, using the following measurements:

Measurement	Length in mm
Blade length	530
Entire length of sword	672
Width of blade at widest point	43
Width of blade at narrowest point	33
Grip length	63
Grip width	21
Shoulder width	52

Table 7: Measurements of experimental sword

The sword was also sand-cast with a metallographic content of 90% copper, 9% tin and 1% lead. Again, the edges were annealed twice and edge hardened before a handle of seasoned ash was fitted, using one copper rivet in each shoulder and two in the grip. The final weight of the sword, including the hilt, was 815g.

4.3.5 Details and manufacture of the metal shield

One metal shield was commissioned, modelled on that found at Moss of Auchmaleddie, Aberdeenshire, currently held at the National Museums of Scotland with the accession number DN4. It measures 480mm in diameter and is 0.8mm thick.

The manufacture of this component of the panoply was not as ‘authentic’ as might have been hoped, due to a number of practical issues. Firstly, it is known that the

original metal shields were beaten out to the required size and thickness from a large solid ingot of alloy, requiring multiple annealings during the process to prevent brittleness. Depending on the method of annealing used, this means that one shield might take a single craftsman, working full time, up to three months to make (Uckelmann, 2011: 189). Time and cost constraints made this method of manufacture prohibitive, so commercial sheet metal was purchased and then further beaten out to the above requirements. The necessity of purchasing commercial sheet metal led to the second practical problem. It was not possible to find 10% tin bronze sheet metal (a common problem also experienced by Barry Molloy during his experimental project in 2006). Therefore the alloy used was, of necessity, 5% tin bronze. Once beaten out, the boss and six ribs in concentric rings were beaten into the face, the edge was rolled over a length of copper wire and a handle was riveted on. In its finished state, the shield was slightly conical in shape, with the face of the shield extending out and slightly backwards from the boss, and weighed 1.9kg.

4.3.6 Details and manufacture of the leather shield

One leather shield was commissioned, modelled on that found at Clonbrin in Ireland, but given the difficulty of accessing material held abroad, the details had to be taken from a photograph.

The manufacturing method employed by both Coles (1962) and Molloy (2006) was followed here. Prior to soaking a large piece of bovine shoulder leather in water, a wooden mould was carved to shape, with three concentric ribs and Vs indented into the surface, in addition to groups of raised dots between the ribs. The wet leather was then fitted into the mould and weighted down to prevent it pulling out of the mould as it dried and shrank. Once dry, the edges curved back away from the face of the shield. The shield then needed to be hardened in one of two ways, either by pouring boiling water across the face or by impregnating with wax. In this case the water method produced poor results so wax was used. It was necessary to heat the leather before applying the wax in order for it to be absorbed and although this could be done authentically over a fire using tongs, again cost and time constraints necessitated the use of a modern blow torch to heat the

leather and then gradually melt wax off a large lump of beeswax onto the face and back of the shield. The warmer the leather, the faster the wax was absorbed. A leather handle was then stitched on. In its finished state, the shield weighed 2.5kg. It measured 635mm in diameter and was approximately 6mm thick (varying slightly over the face of the shield).

4.4 Variables

4.4.1 The location and environment

It is unlikely that the location and environment used in these experiments could have had a significant effect on the outcome of the strikes, but in the interests of complete record keeping, and to allow subsequent replication of experiments, such details were noted.

All experiments took place at Sagnlandet Lejre, Denmark, between 6th August 2009 and 13th August 2009, starting at 10am and finishing at 4pm under a large, open sided tent, providing shade and shelter but allowing natural light and breezes inside. During the entire course of the experiments the weather remained consistently sunny with light breezes, the temperature averaging 22°C. The ground underfoot in the tent was impacted earth and dust with a few gravel-like stones; for a few of the most powerful strikes the combatants moved to a grassier area to gain greater traction underfoot. Additionally, the few strikes made against a pig carcass and the throwing experiments took place in the open, on flat, grassy ground. The combatants were placed so that both were shaded and neither had the sun or slope of the land against them and were filmed from outside the tent, where a wider field of view could be obtained. Each particular strike was repeated, so the combatants took it in turns to attack and defend (i.e., Liz Richardson would attack on strike x in the first attempt, then she would defend on strike x in the second). The primary researcher stood behind the camera with the camera operator in order to observe and provide instructions.

Of all the locational and environmental variables noted, the conditions underfoot

and the gradient of the land were subjectively rated as most important, since these had a direct effect on the speed and strength of the delivery of a strike or the force with which it could be parried. Additionally, they will also have an effect on the stamina required to continue combat over a period of time.

4.4.2 The combatants

When observing a martial arts training session, the difference between those with some year's training experience and new beginners is not simply one of knowing particular movements and theory. It takes time for an individual to become physically comfortable making the movements required; learned balance and muscle memory are crucial in enabling the combatant to move smoothly and efficiently when striking or defending. In order to comply with Callahan's (1999: 5) guideline that the experiments should not be interfered with by the acquisition of basic skills, two volunteers experienced in martial arts were required to physically make the strikes.

The first, James Parrish, weighed 86kg and measured 173cm tall. Throughout the experiments he wore training shoes, loose nylon shorts and a cotton t-shirt. The second, Liz Richardson, weighed 75kg and measured 176cm tall. Throughout the experiments she wore training shoes, lycra trousers and a loose cotton t-shirt. The similarity in height and weight between the two volunteers reduced the chance of one having an innate 'advantage' over the other, although the possibility of this having an adverse effect on the validity of the results was further reduced by alternating striker and defender on each attempt at the individual strikes.

When defending a strike the combatants wore a fencing helmet with plastic eye goggles underneath, a fencing glove to protect the hand holding the shield and a Shorinji Kempo dō to protect the torso. When attacking, the same equipment was worn except that the helmet used was a kickboxing sparring helmet (see Fig. 14).

James has trained for several years in Kendo, fencing and re-enactment combat experience, while Liz has trained for several years in Krav Maga, Tactical Edge and kickboxing. This meant that both had experience of using edged and pointed

weapons in combat and were used to the physical movements involved in attack and defence.

4.4.3 The choice of impacts

It was hypothesised that a number of variables involved in a strike, falling under one of the following headings, might affect the damage outcome:

- Angle of strike (measured at 45° and 90° to the ground)
- Movement of strike (stab, slash, throw, over-arm, under-arm, straight)
- Mode of defence (edge of weapon or shield, face of shield, flat of weapon, held still or moving)
- Attacking material (sword or spear)
- Defending material (sword, spear, metal shield, leather shield)

A range of strikes was developed with combinations of these variables in mind (see Appendix 4). Each strike was scheduled to take place twice to test the replicability of the results produced.

In addition to these pre-arranged strikes (subsequently to be called formal strikes, as opposed to the informal ones described below), circumstances allowed unexpected access to a fresh pig carcass which was used as a substitute for a human body. Four slashes were made against the legs, four slashes were made against the body and four stabs were made to the throat and shoulder area, using the sword and spears. Additionally, once the formal strikes had been made and documented, experiments were conducted by placing the shields on the ground or on straw bales and attempting to test them to destruction. This method enabled the combatants to make strikes using varying degrees of force in order to determine the minimum force necessary to cause damage, in addition to gaining an idea of the length of time and force required to significantly damage the materials. In these latter cases, not all individual strikes were documented as the aim was to gain subjective experience rather than controlled data, but general results were noted down instead.

4.5 Methodology

Prior to beginning combat experiments, all the weapons and shields were thoroughly examined and photographed, with particular attention paid to any pre-existing damage. The spears were numbered 1-33 with a marker pen to identify them and then used in the combat experiments in that order. As soon as a spear sustained even the smallest evidence of damage, a new one was shafted to use in the next experiment. The shield faces were divided into eight quadrants and also into the Boss Area, Inner Area and Outer Area (see Fig. 15), in order to enable accurate descriptions of where damage was being sustained.

Before each experiment was made, the combatants practiced the movements required several times (in order to maximise safety and ensure the correct strike was made) using 'wasters' – wooden swords, spears and shields. Once prepared and equipped, the digital camera started recording, the strike was made, the camera would be stopped and the weapons examined for damage. If a strike caused damage to either the shield or weapon it was noted, measured and photographed. Additionally, ongoing notes were made on other variables, such as weather, temperature, which combatant was defending and which attacking and so forth.

Over the course of the experiments some practical issues were raised and resolved regarding use of weapons in combat. A serious problem throughout was the possibility of a failure of one of the weapons, in particular the bending of the sword blade and the breakage of spear shafts. The sword bent in multiple directions over the course of the experiments to an estimated 15° angle. Fearing to damage the sword further, or even break it, no attempt was made to correct this until the formal experiments were over, whereupon the sword was successfully straightened over a knee a number of times (although this did lead to noticeably greater flexibility the more it was done). The spear shafts exhibited a tendency to snap off, either at the socket or around 5cm below it, leaving a distinctive jagged appearance, whenever it was struck very hard against another object (see Fig. 16). During the course of the experiments five spear shafts were snapped in this way. When it happened, it became impossible to remove the remaining wood from the spearhead, rendering it useless for further work. It is possible that the shaft itself

was modified in some way to reduce this tendency, either through fire hardening or the use of some kind of binding, but without direct prehistoric evidence, experimentation into such strategies would be overly speculative.

In addition to weapon failure, a second practical issue concerned effective use of the weapons and shields. While it was not possible easily to address the problems relating to the sword and spear shafts, it swiftly became clear that shield damage could be greatly reduced depending on the method of use. When a shield is held directly in front of the body and used to absorb the full force of an oncoming strike not only does this method require considerable strength on the part of the defender, but it risks significant injury as well if the weapon goes through the shield. Further, it raises the likelihood of causing considerable damage to the shield itself. Early in the experiments both shields sustained quite severe scratching, and even some perforations, before the volunteers grasped the technique of holding the shield away from the body and *parrying* the strikes so that the force is directed away from the shield rather than absorbed. The mode of use of the weapons was also crucial, although in this case crucial to the success of the strike rather than crucial to preventing damage. When either the sword or a spearhead struck another object head-on, with no further movement, it was not very effective in causing damage. Particularly when striking the pig carcass, but also when striking the shields, such a technique often resulted in the weapon almost rebounding off the target and causing little damage. However, when the weapon described an arc in the air, cutting into the target and then continuing to slash down and away, it was extremely effective. Again, this was most notable during the strikes made against the pig carcass; the first strike method typically caused a very shallow, short cut to the epidermis while the second method was easily capable of cleaving skin, flesh and bone in one strike (see Fig. 17). Clearly, the more slashing movement involved, the more significant is the damage.

4.6 Results

The full list of results from the experiments is provided in Appendix 4.

4.6.1 Spear edge wear

The first hypothesis for these experiments was that spears were likely to sustain damage through thrusting or throwing, and that the absence of appropriate damage meant such modes of use were not commonly used in the Late Bronze Age of northern Britain. This was found to be incorrect. Thirty of the formal strikes involved throwing or thrusting with a spear point, yet only two of these (Strike 3, Attempt 1 and Strike 30, Attempt 1) caused any damage at all. The first caused a slight flattening to the tip while the second caused a slight bend. A further two of the informal strikes also caused similar tip damage, after being stabbed down onto a metal shield and thrown at a metal shield respectively (see Fig. 19). Clearly, the tips of the spearheads are extremely resilient and do not easily sustain damage, suggesting that the lack of damage to the tips of the original spearheads was not a result of lack of use in this way.

The second hypothesis regarding spear use, that the damage seen on the original spearheads could be replicated by using the spears in the same manner as the sword, was proved to be correct – to an extent. One of the first realisations from the experiments was that the slashing strikes could not safely be performed with a longer (approx. 150cm) shaft attached. The extra length risked striking the attacker's inner elbow and tangling with their legs. It also complicated the way the spear was gripped, requiring the user to shift grip numerous times throughout a single strike in order to retain control. Although the experiments themselves involved only two combatants, it is also highly likely that combat involving a larger group of individuals would not be possible using longer shafts, as a spearbearer would be as much of a danger to their own side as to their opponents. Consequently, the slashing strikes required the use of the 78cm shafts.

The spears were used to make a total of 24 slashing strikes, as had been made by the sword. Of those, 18 resulted in instances of damage, the precise groupings of which are shown below. As can be seen, in addition to the six damage types identified by Bridgford, a further type, that of 'flattening', has been added (see Fig. 20). This flattening effect, produced six times during the experiments, was also visible on some of the original spearheads and swords, although unfortunately the incidence rate was not noted during data collection.

Damage	Spears	Sword
Bow	2	6
Notch	0	3
Nick	0	2
Chip	12	3
Score	0	2
Tear	1	10
Flattened	3	3

Table 8: Occurrence of each type of edge damage from experimental strikes

These damages could not be related to any particular style of strike or angle of strike, but they did relate to the defending material. No strike against either shield caused the spearheads any damage, but, perhaps unsurprisingly, strikes against the sword and other spearheads almost invariably did. Crucially for this hypothesis, the table above clearly shows that the strikes resulted in a very low range of damage types, and that the vast majority of these were chipping, which does not correlate to the patterning seen on the original spearheads. There are problems with drawing direct statistical comparisons of damage levels between the experimental sample and the prehistoric sample, given that there is no guarantee of parity in terms of usage. However, the following table presents a general impression of variations in damage levels by totalling the number of damages in each population and then finding the percentage of those that were of a specific damage type:

Material	Bows (%)	Chips (%)	Notches (%)	Nicks (%)	Scores (%)	Tears (%)	Flattening (%)
Original Spears (89)	47	19	15	6	0.8	11	Unknown
Experimental Spears (33)	13	80	0	0	0	6	6

Table 9: Proportionate representation of damage types from the total number of instances of damage in the original and experimental spearhead populations (NB: flattening was not studied in the original population and therefore figures are unavailable for this category)

Clearly the original artefacts showed a wider and more even spread of damage types, and certainly did not mirror the high proportion of chipping seen in the experimental sample. In fact, the original spearheads exhibit a high proportion of

bowing, also seen on the experimental spears but not to the same degree.

Several of the experiments involved stabbing the spears against the shield faces. Although the strikes were made with some force, they resulted in surprisingly little damage to the shields, certainly not making the sorts of holes that might have been expected after looking at the damage on such examples as that from the River Thames, England (see Fig. 21). During the informal experiments, attempts were made to create holes in the shields by placing them on the ground and using the spears to stab down into them with extreme force, but again, this did not create the damage expected. It was found that the only way to pierce the shields was to throw the spears at them, which succeeded in penetrating the shields almost every time, causing a very distinctive damage pattern (see Fig. 22).

4.6.2 Shield edge wear

The third hypothesis proposed, that both the leather and metal shields would prove to be functional (as demonstrated by maintaining rim integrity) throughout the experiments, was also proved correct, but again, with qualification. Each shield was subjected to 26 strikes, falling on the face and the rim. Both were significantly damaged by the conclusion of the experiments, but neither had lost the structural integrity of the rim, which remained intact. The wire rim of the metal shield and the curvature at the edge of the leather shield are the most likely reasons behind this.

However, rim integrity is not the only aspect of functionality that is important, and having completed the experiments it became clear that other aspects of shield damage would severely compromise its functionality in terms of combat use. The metal shield was found to bend significantly on strikes 9 attempt 2, 12 attempts 1 and 2, and 16 attempts 1 and 2. These damages not only made the shield difficult to hold, but also limited the area upon which a strike could be blocked and made it difficult for the user to adequately defend with it. Further, the boss itself was found to be very weak and one direct strike alone (from strike 10, attempt 2) caused a very large dent indeed (see Fig. 23). Such a weakness puts the user's hand in some danger and subsequently made the shield uncomfortable to hold, as

it limited the space for the hand. It proved possible to repair such damages by beating the shield approximately straight again with a modern hammer, but it is doubtful that even the most careful hammering treatment could help it regain its original symmetry. Aesthetically speaking, it was beyond repair.

The leather shield was also damaged in such a way as to limit its functionality. While it did not suffer the sort of direct damage through blocking strikes that the metal shield did, it became progressively more flexible as the experiments continued, to the point of beginning to lose functionality altogether (see Fig. 24). Given that the shield was originally hardened using beeswax, the hypothesis that the shield could be re-conditioning using the same process was proved correct. Time and space prevented work taking place on the entire shield, but a large triangular section was cut from it, warmed over a gas flame, dipped in a bath of liquid wax and left to cool. This process re-hardened the leather considerably, and it was found to be increasingly effective with each procedure – after the fifth dipping and cooling, the leather was almost entirely rigid. However, this procedure took some time and could not be completed swiftly at need.

4.6.3 Sword edge wear

The thinking behind the design of the experiments was concerned mainly with the usage of the spears and shields, but the use of the sword raised some interesting points. Firstly, the damage that the sword sustained was severe, far more so than expected, particularly when compared with the damage the same strike caused to the opposing weapon (see Fig. 25). A variety of authors have created subjective terms to describe the edge damage visible on prehistoric weapons; one of these terms relates to the level of edge damage, and between Bridgford (2000) and York (2002), there are five levels possible, ranging from ‘no damage’ to ‘catastrophic damage’. The majority of the damage to the swords when struck against spears appears to be level 4 – previously described as severe, as if hacked by an axe. Assuming that the methodology of these experiments was correct, these results should necessitate a re-examination of how weapons in previous edge wear studies have been classified. If the severe damage seen here is the result of ‘normal’ combat, then what were the actions and circumstances that resulted in the damage

usually classified as ‘2’ (slight, not necessarily combat damage) and ‘3’ (combat damage)? More pertinently, the relatively few examples of LBA swords classified as sustaining level 4 or 5 would indicate that the population of combat-damaged swords is far smaller than previously thought. However, it must also be considered that the methodology of the experiment is flawed in one of two ways; either some aspect of the manufacture of the sword has created a difference between it and the original swords in a micro-structural sense, or the combat techniques employed in the experiments do not accurately reflect those employed in the LBA. Both possibilities will be explored in the chapter discussion.

A second unexpected consequence of the experiments was that the sword became bent after several strikes. After an informal strike, when the sword was used hard against one of the upper bones in the foreleg of the pig carcass, not only did it sustain a minor bowing damage but it also bent in two opposing directions (see Fig. 26. This distinctive patterning is also visible on a number of the original swords and, unlike the more dramatic bends which are attributed to ritualistic ‘killing’ of the sword before deposition, has not previously been discussed. Interestingly, throughout the course of the remainder of the experiments, although some strikes seemed to increase the degree of bending in the sword, some also seemed to straighten it slightly, presumably the result of using different edges of the sword. Deliberate re-straightening over the knee did not prove an effective solution to this form of damage, since multiple treatments resulted in increased flexibility, swiftly rendering the weapon ineffective.

Finally, mention should be made of the sword hilt. The sword was used to make and defend a great range of strikes, and at one point was struck on the hilt with a spear, which chipped the wood and exposed the shoulder, but at no point was the metal component of the hilt damaged. Neither combatant described the hilt as feeling ‘weak’ in any sense or felt that the hilt, specifically, might fail during combat. Many of the original swords can be seen to have broken hilts, which admittedly may be the result of post-depositional damage, but some also show evidence of repair to the hilt after part of the original was snapped off. On the basis of these experiments, it is hard to see how such a type of damage could occur.

4.6.4 Vickers hardness testing

Clearly these results, while interesting, need to be set in context and each result made comparable with the others and with previous and subsequent work. This can be done through the medium of Vickers Testing, a process that measures the structural strength of a material and provides a quantifiable result. Not only was a range of weapons tested, but tests were conducted on different areas of the weapons, to determine variability across the whole of the object. This should result in a greater understanding of the differing areas of hardness within, and between, the weapons, and provide a degree of comparability between these results and those from other experiments. It should be noted that not all the weapons used in the experiments could be tested, as a number remain at the Lejre centre in Denmark for use in further experiments and public education.

The machine used for these tests was a VHTM 2000, made by Vickers Ltd Engineering Group, with a standard load of 30kg and indentation time of 15 seconds. During testing the item is held in place while the machine forces a specific amount of weight through the point of a tiny diamond into the material, making a very small indent. The size of the indent is then calibrated to provide a reading. The softer the material, the larger the indent will be. One problem with the process in this case is that the material for testing was not flat and even. The spears have a rounded midrib from which the blades protrude at an angle considerably greater than 90˚, while the sword has similar issues surrounding varying angles. The result of testing an angled surface is a kite-shaped, rather than diamond-shaped, indent, which will give an incorrect reading since the readings between each set of opposing points will be different. In order to ameliorate this issue, plaster moulds were made to hold the weapons steady and at the correct angle. On the spears, indentations were made on the midrib and on two areas of the blade – by the wing and near to the tip, keeping as close to the edge as possible (see Fig. 27):

Weapon	**Hardness of Edge near Socket** (HV/30)	**Hardness of Edge near Tip** (HV/30)	**Hardness of Midrib** (HV/30)

Spear 2	154	165	82.5
Spear 3	136	181	88.7
Spear 4	197	182	93.3
Spear 5	156	190	73.3
Spear 6	149	160	81.7
Spear 7	122	168	84.4
Spear 10	154	150	75.6
Spear 11	125	128	73.5
Spear 14	134	115	75.6
Spear 15	101	129	68.2
Spear 16	120	158	69
Spear 17	136	120	73.8
Spear 18	115	156	69.9
Mean:	**138** (1sd = 24.34)	**154** (1sd = 24.45)	**77.6** (1sd = 7.83)

Table 10: Vickers hardness values of edges and midribs of experimental spearheads

Indentations were made on the sword, on both the edge and the midrib, at the tip, halfway down the blade and next to the hilt (see Fig. 28):

	Area of Sample Tested	
Area of Sword	**Edge (HV/30)**	**Midrib (HV/30)**
Tip	148	80
Middle of Length	109	75
Hilt	120	65
Average	**126**	**73**

Table 11: Vickers hardness values of edge and midrib of experimental sword

To set these results in a general context, the lower the number, the softer the material is: 55.7 is the lowest number the machine will register, while 2173 is the highest. Stainless steel has a Vickers score of 180 HV/30 (Hannah Wilson, pers.comm.). More specifically, these can be compared to hardness testing on LBA objects conducted by Tylecote (1986) and Bridgford (2000). The hardness values for the midribs are similar to those found by Tylecote (1986: 31-35) and Bridgford (2000: 217-230) for the central areas of Irish and British Late Bronze Age weapons, which suggests that the relative proportions of metals within the alloy of the experimental weapons was appropriate. However, there is a variation between

the hardness values obtained for the work-hardened edges of swords and spears in the three studies:

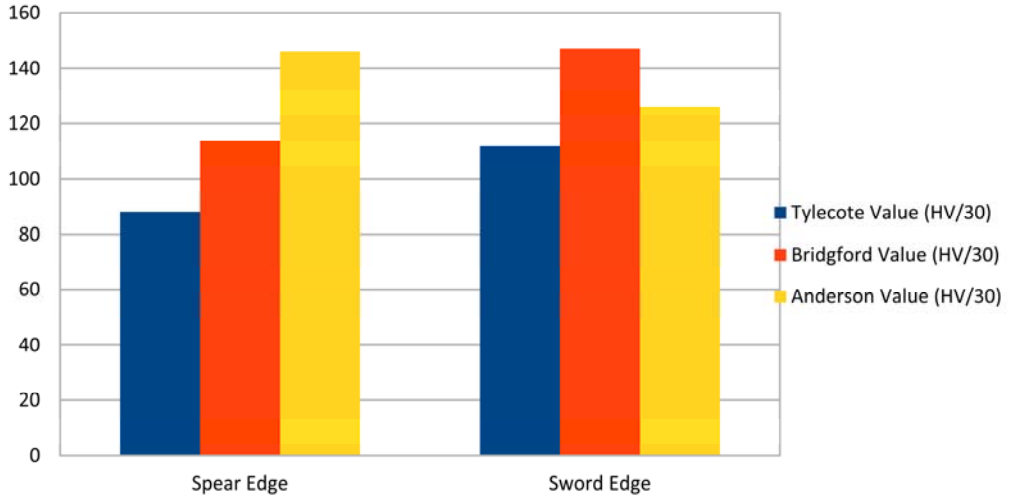

Illustration 15: Comparative Vickers hardness values of original and experimental sword and spears

The values for the sword edges are roughly similar, but there is greater disparity in the figures obtained for the spear edges, for which they may be a number of explanations. Firstly, testing such objects accurately is extremely difficult and liable to result in distorted data, which may have affected one or more of the studies (Wilson, 2010). Secondly, variations or mistakes at the 'pour' stage of manufacture can lead to high levels of porosity within the material, which will affect the results if the indentation is placed over one of these. Thirdly, and the most probable explanation, is that differences between modern and prehistoric edge hardening techniques has resulted in the edges of the experimental weapons becoming hardened well beyond the hardness of the original population.

The results themselves indicate that although the degree of variability within each testing area differs, a high level of homogeneity in hardness of the midribs of both swords and spears indicates an even distribution and proportion of the alloying metals within the metal matrix of the spears. The difference between these central areas and the edge areas demonstrate the efficacy of edge-hardening in general. Although there is some unevenness and individual anomalies in the degree of edge hardness of both types of weapons this is possibly the result of varying force applied during the hammering process. Additionally, given that the areas being

hammered and annealed grow progressively closer near the tip of the weapon the effect may have overlapped and increased during this stage of finishing (Wilson, 2010).

4.6.5 SEM testing

One might expect that experimental spearheads with a greater degree of edge hardness than the original spearhead population would suffer different forms of damage under combat conditions. Particularly if increased hardness caused the edges to become brittle, such factors might explain a higher degree of ductile damage (bowing) in the original population, while a greater proportion of metal loss (chipping) in the experimental population. However, examination of the damage under an SEM microscope not only disproves this idea, but indicates that distinguishing between specific damage types is not as useful or informative as previously thought.

After the combat experiments were completed, the 13 remaining spears and the sword were given to Hannah Wilson, a 4th year undergraduate mechanical engineering student at the University of Edinburgh. Wilson reviewed the damage classifications used in the experiments, noted that they appeared different macroscopically, and redefined them from an engineering perspective:

Damage Type	**Description**
Bow	Plastic deformation. No material loss.
Chip	Brittle fracture, exhibiting little to no prior ductility.
Notch	Damage primarily shows signs of ductility, but with a little brittleness.
Nick	Similar to notched, but the deformation is narrower.
Score	Plastic deformation, with minimal or no loss of material.
Torn	Completely ductile damage, extensive plastic deformation. No loss of material.
Flattened	Similar to bowed, primarily plastic deformation.

Table 12: Edge damage types from a mechanical engineering perspective (after Wilson, 2010: 21)

These suggest that bowing, tearing, scoring and flattening are ductile forms of

damage, while chipping is a brittle form. Notching and nicking are a mixture of the two. Consequently, the damage forms should present as varying fracture lines or forms of plastic deformation when examined under a microscope – for which scanning electron microscopy (SEM) was deemed more appropriate than a regular optical microscope since it provides a better depth of field and a higher resolution. However, despite the damage types appearing very similar to the naked eye, under the microscope all the forms of damage appeared as plastic deformation, which sometimes led to ductile fractures. Wilson proposed that if the damaging load were increased sufficiently then material might subsequently be lost – leading to the brittle appearance during macro examination. Crucially, this means that although the seven types of damage identified might be useful in terms of descriptively differentiating individual incidences of damage on a particular weapon, and also in terms of documentation, the damage forms are not different from a mechanical engineering perspective. Which in turn indicates that the higher degree of edge hardness in the population of experimental spears than is seen in the original population was not significant in affecting the experimental results. Not only do these results show that it would be meaningless to link particular types of strike with particular damage forms, but simple quantitative analysis examining damage type occurrence is also without value. The one possible exception to this is in the occurrence of material loss – most notably occurring in chipping, but also in notching and nicking – which appears to be the result of a high degree of force during the application of the strike. Should these damage forms be evidence of particularly strong attacks, then the relative proportions of damage shown in Table 9 indicate that the strikes made during the experiments were generally harder than those made using the LBA weapons. Ideally the original weapons would be examined in the same manner, to ensure that the damage visible on those weapons was also due solely to plastic deformation, but since such testing requires sections to be cut out of the blade edge the harm outweighs the potential benefits.

4.7 Chapter discussion

4.7.1 Spearheads

The spearheads proved to be effective in causing damage when thrust and thrown, although their usefulness in the latter capacity is somewhat constrained by limited accuracy. Both the volunteers for this experiment and very experienced spear casters working at the Lejre centre found that maintaining accurate aim on a small target from anything more than approximately 3m away was difficult. While practice can undoubtedly improve the distance it is possible to throw the weapon, it is unclear whether the matter of aim could be resolved. Additionally, they also travel relatively slowly in flight, providing an alert and unencumbered opponent time to move to safety. It seems likely that these types of spearheads could only have been combat-effective in a throwing capacity if a large number of spearbearers cast at a large, solid block of opposing combatants unable to manoeuvre swiftly out of the way. It is perhaps more likely that spears were thrown for a purpose other than injuring an opponent. There could have been a symbolic or psychological advantage to making some kind of throw in a combat situation, or the casting of spears at a shield could have been an element of a pre- or post-combat ritual, or of a pre-depositional ritual. If a sword can be ritually 'killed' before deposition then the same treatment could be applied to a shield.

Unfortunately, this does not provide an explanation for the instances of remarkably similar damage patterns on some original metal shields that are also seen on the experimental one. Perhaps the casting of spears at a shield could have been an element of a pre- or post-combat ritual, or of a pre-depositional ritual; if a sword can be ritually 'killed' before deposition then it is certainly possible the same treatment could be applied to a shield.

The spearheads were certainly effective when used with a short shaft, but the specific length of each shaft would almost certainly be dictated by the height and personal choice of the user, and possibly affected by the other weapons or defensive armour employed and the level of skill and training of the individual. Given the similarity in damage location and patterning between those on the original spearheads and those produced by the experiments, it is possible the spears were being used in slashing motions, like a sword. During the initial analysis of results, it did not prove possible to link specific variables (such as

angle or direction) directly to damage types, other than that striking a blade edge against the edge or ribs of the metal shield frequently produced flattening damage. However, subsequent analysis under the SEM microscope indicates that there is no mechanical difference between the edge types previously identified, other than that where metal loss occurs it may be the result of a particularly forceful strike. Consequently, further analysis based on the damage types is unlikely to yield valuable information unless that analysis focuses on patterning within the occurrence of metal loss, which might suggest particular contexts, occasions or locations in which varying degrees of force were used in combat conditions.

Although there is no direct evidence to support the modification of spear shafts to limit their propensity for breakage, it does seem logical that such attempts would have been made. There would be value in further experimental work to identify a range of *potential* methods of preventing shaft breakage. An alternative, or additional, response to the issue of shaft breakage could be the employment of multiple spears by each individual. Snodgrass (1964: 136-139) notes iconographic examples of LBA Greek warriors carrying multiple spears into battle (although in the context of a discussion on spear style and usage). Of the 17 tomb groups containing multiple spearheads within the same interment, 4 contain spears of different sizes which Snodgrass suggests indicates an example of the full weapons panoply of a warrior, containing a smaller throwing and larger thrusting spear. The remaining 13 are viewed less functionally, as simply expressions of wealth. Poor preservation and a lack of contextual details make it hard to compare the northern British material with the Greek graves, but there are four locations in northern Britain from which multiple spears have been found which are well preserved enough to take measurements from. Of these, one group contains only large spears (based on whether they are greater or smaller than the mean for that measurement), one group contains only small spears, while the other two groups are divided equally into large and small spears. It seems illogical to view the 23% of Snodgrass's material that supports his argument as meaningful, while the 77% that do not are considered simply expressions of 'the wealth of the deceased' (1964: 137). It is entirely possible that variation in the size of interred spears from Greece and northern Britain indicates individuals carrying multiple spears for differing

purposes, but it is also possible that they carried multiple spears as a form of redundancy.

4.7.2 Shield use

At the start of the experiments it very quickly became apparent that there was an optimal method of blocking with the shields – obliquely, using the face of the metal shield or the rim of the leather shield to parry the blow past the defender (the difference in location is due to the tendency of the metal rim to buckle and the leather face to catch and hold the tip of a weapon). Together with the necessity of using the shields pro-actively, this suggests that shield use required at least some level of training; a factor to consider in any further work in this area.

Neither type of shield is suitable for use in very lengthy combat situations. The metal shield was prone to denting and bending to such an extent that it swiftly became uncomfortable to use and potentially dangerous to its owner, while the leather shield remained comfortable but became progressively more flexible. This might suggest that the metal shields could have been used for brief engagements, such as single combat, and that the leather shields could have been used in longer, more battle-like conflicts, although eventually it would also become a hindrance. The latter suggestion may be an over-simplification, but the connection between circumstance and choice of tool should not be overlooked. It is clear that both shields, had they been damaged during earlier activity, could be made combat ready again, but only in functional terms. Aesthetically, such damage could be reduced but not hidden, which suggests that the majority of the metal shields currently held in museum collections were never used in combat, regardless of their capacity for such.

4.7.3 Sword use

The disparity between the ease with which the experimental sword could be severely damaged and bent, and the relatively minor edge damage seen on the originals, does not appear to be the result of a disparity in edge hardness (see Fig. 25 and Illustration 15), but is more likely to relate to the force used during combat (see section 7.6.5). It appears likely that the strikes made during the experiments

employed a greater force than those that made the damage on the original weapons, although it is also possible that the original combatants developed particular fighting styles and techniques to consciously allow for the potential weaknesses of their weapons. Combatants could have been deliberately striking and parrying in such a way as to minimise the damage to their equipment, or they might simply have limited the force exerted. Further clues to suggest a fighting technique or style not used in these experiments is the lack of any damage to the metal in the hilt area of the sword; while many original swords are missing the pommel and upper grip area of the hilt, or show evidence of repair from such damage, the experimental sword showed no signs of any strain on that area. It is possible that such damage is the result of a particular technique not envisaged here. It is possible that combatants used the flat of the sword to block blows; however, when this was attempted during the experiments it was found to cause damage to the striking weapon and also cause distinctive damage to the flat of the sword, which is rarely seen on original weapons, indicating that that particular technique could not have been frequently used (see Fig. 29).

The damage to the experimental sword was not only of a greater magnitude than that seen on the originals, but was also significantly greater than that seen on the experimental spears. Having ruled out the relative edge hardnesses as a significant factor in the variation, Wilson (2010: 38) posits that the geometry of the weapons may have played a role, since the central socket of the spears may resist impact better than the midrib of the sword. However, this explanation would indicate that variations in spearhead morphology might have a significant effect on the degree of edge damage that might be sustained during conflict, and therefore the results obtained from the experimental spearheads may have limited applicability to spearheads with other morphologies. Further investigation into the extent to which morphology affects structural vulnerability would be useful here.

When examining weapons for use-wear, it may be worth accepting double bends of around 10˚as a sign of use, particularly in combination with the more traditional evidence identified by Bridgford. This is not wholly unproblematic, since 12% of the examined LBA swords in the dataset were deliberately bent before deposition

and 24% sustained similar, post-depositional damage. However, the former damage tends to involve severe bends of at least 50˚ in one direction, while the latter is usually more lightly bent, around 30˚ or less, but again, only in one direction. Although it is unfortunate that double bending and flattening edge damage were identified as markers of combat damage post data-collection, and their full implications cannot therefore be analysed within this thesis, it is to be hoped that they will be added to the other forms of recognised combat damage in further work on the topic.

4.7.4 Edge hardening

An improvement in hardness gained through the process of edge hardening should not itself be a surprise, since that is its primary purpose, but its level of efficacy is unexpected. However, it does raise questions regarding how such weapons would fare *without* being edge hardened. Of the examined weapons in this dataset, 57% of the swords and 60% of the spears have no visible edge hardening (although in many cases, this may be because the item is only a hilt fragment or is too corroded to reveal it). It is possible that a degree of edge hammering took place which was insufficient to leave visual evidence but nevertheless provided some measure of work-hardening. However, even in these cases a deliberate choice has been made not to edge-harden the blade to its full potential and therefore perhaps these weapons were never intended for use under normal circumstances. Further investigation into the life cycles, alternative potential functions and roles for these items could well prove fruitful.

Another avenue of future research that prove beneficial could involve running similar experiments, but hardness testing the blade edges before and after each strike in order to see whether the strikes themselves have an effect on the structural integrity of the weapons.

4.7.5 General discussion

The results of these experiments have prompted some speculative interpretations regarding the generalised nature and practice of combat in the LBA in relation to warfare (as opposed to more generic ‘conflict’).

1. The mechanical similarity of the damage types suggest that the difference in damage patterns on the original and experimental populations are the result of variability in force applied, rather than technique. However, certain modes of use were clearly ineffectual or positively damaging to the weapons, and therefore the skill required to avoid these suggest that the majority of combatants would have experienced some level of on-going training in weapons use; either the combatants were drawn from a warrior-class, or the societies in question ensured some level of military training across the entire population

2. The ease with which the weapons panoply could become heavily damaged quite swiftly, might point to short-lived single combats taking the place of inter-group fighting

3. Neither the modes of use that the results of these experiments suggest nor the evidence from the prehistoric material lends itself to the theory that groups of combatants were fighting using techniques suitable for organised units, such as an earlier version of the Saxon shield wall technique. Instead, the space required for using the weapons effectively and the damage sustained suggest single combat or, where groups were fighting, a melee

4. Although metal shields *could* be functional combat items, the resulting damage was easily visually identifiable. Unfortunately only a small number of shields are extant from northern Britain, but the lack of visible damage on the majority suggests a normatively non-combat role for metal shields. The Beith shield, the only northern example exhibiting such combat damage, was probably struck by a thrust spear (see Fig. 30 to compare the Beith and experimental damage), an action which may or may not have had a ritualised context.

Chapter 5: Typology and Classification

"A typology is a conceptual system made by partitioning a specified field of entities into a comprehensive set of mutually exclusive types, according to a set of common criteria dictated by the purpose of the typologist. Within any typology, each type is a category created by the typologist, into which he [sic] places discrete entities having specific identifying characteristics, to distinguish them from entities having other characteristics, in a way that is meaningful to the purpose of the typology" – Adams & Adams (1991:91)

This chapter is less concerned with the metaphysical theory of typologies than it is with solving the problem of trying to include in a wider analysis a group of artefacts, iron spearheads, which are fundamentally undifferentiated (see chapters 2 and 3). Before attempts are made to typologically classify the spearheads, whether from a traditional or statistical perspective, a discussion must take place on style and identity, past and present typological theory and the practical methodologies employed in classifying related material.

5.1 History of typology

The practice of placing archaeological material in 'order' began with Christian Jurgensen Thomsen in the 19th Century, as a method of organizing the material held by museums. Oscar Montelius took this a step further, developing seriation to provide relative chronologies for the material; typological method is usually used to refer to the method devised by Montelius to establish evolutionary-genetic links between artefact types (Renfrew & Bahn, 2004: 120-121). This was the starting point for all subsequent typological sequencing. The goal of developing working typologies, originally to provide relative dating, expanded; typologies were able to indicate relationships between cultures and areas, as well as time periods. Even after the development of absolute dating methods, typologies continue to be useful in cases where lack of organic material, or funding, inhibit absolute testing.

5.1.1 Typological purpose and terminology

It is regrettably easy for archaeologists to get lost in the creation of typologies for their own sake (Clark, 1952), forgetting that the typology itself is intended merely as a tool "designed for the reconstruction of culture history in time and space. *This is the beginning, and not the end, of the archaeologist's responsibility"* [italics added by author] (Ford, 1954: 52). As a tool, then, typologies are most useful when their purpose has been deliberately considered and explicitly stated. Adams & Adams (1991) discuss in great detail the multiplicity of purposes that a typology might serve, beginning with what they term 'basic purpose' – involving learning something about the specific material in question, rather than using it to provide information on another source of material (instrumental purpose). This basic purpose can be divided into descriptive purposes (describing a mass of material in a swift manner), comparative purposes (allowing formal comparison of material from different sites, periods or areas) and analytical purposes (involving enlarging our knowledge and understanding of the material itself). Analytical purposes encompass what is termed 'historical basic purpose', which seeks to understand the development and change of a material group over time and space.

The chosen purpose of a typology rests not simply on the interests of the researcher but also on the limitations of the data to be worked with. Both Orton (1980: 29) and Marchant (1990: 2) note that the most successful typologies (even where description is not the primary focus) convey a large amount of information very quickly; a sentence as brief as "it may be Manning Type 3" will provide the reader with information on the origin, manufacture, size and shape of the object in six words. A basic descriptive purpose will therefore be of primary importance where assemblages from a single location are being classified, such as the Brailsford (1962), Scott (1980) and Manning (1985) typologies developed for the Roman spearheads from Hod Hill in Dorset, or, as here, in the initial stages of examining an undifferentiated mass of material. In some cases these can be further developed to provide insight into chronological or stylistic patterning. Where larger groups of material with varied origins are being analysed, such as the Anglo-Saxon spearheads of England analysed by Swanton (1974) or the British

Bronze Age swords analysed by Colquhoun and Burgess (1988), geographical patterning may also be found.

In practice, typologies usually fall into one of two categories; 'functional' typologies are those that consider the development of weapon attributes to primarily reflect use and changing fighting styles, while 'stylistic' typologies (usually implicitly) seek meaning in the attributes themselves. Some features of weapons, such as decoration, are clearly purely stylistic, while others, such as rivet size, are functional. However, the majority of aspects of a weapon could be considered as expressions of style and/or function, depending on the perspective and interests of the researcher. Weapon typologies are usually created with either a stylistic or functional development in mind, with functional perspectives becoming more prevalent in recent years. Whichever approach is used, however, the question of *why* weapon attributes evolve and vary is crucial.

Where functionality is paramount, there are a number of reasons for weapon development. The changing form and material of swords and shields may indicate a need for utilitarian efficiency in a form of early arms race, or may represent developments in social organization which had an effect on fighting styles. Unlike the rest of the weapons panoply, spears are multi-functional and can be used in a number of activities and ways; in addition to the above considerations, variations in spearhead form can indicate optimal modes and occasions of use. However, where the researcher believes that the object may have held primarily symbolic importance (particularly relevant with high status artefacts like swords) then a stylistic approach will be appropriate. In this case, the potential reasons behind attribute change become more complex, linking typological theory with psychological and anthropological research.

In her study of Kalahari San projectile points, Wiessner defines style as "formal variation in material culture that has a distinct referent and transmits a clear message to a defined target population about conscious affiliation or identity" (1983: 256). She further identifies two key forms of style; emblemic and assertive. Emblemic style expresses group affiliation or identity and would be expected to

change only gradually through errors in reproduction over time or to change rapidly when the culture of the group itself changes. Emblemic style may be particularly important in relation to weapons, carrying potentially vital information to an observer on the group affiliation of the owner, and the threat that they might pose. Assertive style supports and expresses information on individual identity and the rate of change depends on innovation and diffusion. Consequently, profiles of change through time may indicate socio-economic changes and should be examined in this light, where possible. These types of styles are not mutually exclusive and can be found in a single item. It may be possible that typological groupings of the iron spearhead population which show regional variation will enable identification of key emblemic, and possibly assertive, stylistic features on these weapons.

Interestingly for this study, Wiessner found that under conditions of group stress (armed conflict with another group, for example) a high level of emblemic stylistic variation between groups would be expected (1983: 271). Style can efficiently convey multiple messages to linguistically and socially distant groups, providing a discreet and fast exchange of important information before further contact, in addition to promoting intra-group cohesion and inclusion. Therefore, differences in group styles will be accentuated by periods of socio-economic stress. This has implications for the identification of periods of heightened conflict in prehistory and should be considered when examining typological variation within artefact classes. Although yet to be comprehensively combined, stylistic and functional approaches are not mutually exclusive and any analysis will benefit by keeping both perspectives, and their possibilities, in mind.

In addition to an explicit understanding of the intended purpose of each typology, clarity in relation to the terminology used in the following discussion will be important. Firstly, the words ‘classification’ and ‘typology’ are not interchangeable. Classification concentrates on the logic of grouping and sorting of material – for example, taking a number of bronze spears and sorting them into groups relevant to each other. Typologies consider the development of types and then place that material in a wider context with other artefact classes, geographic areas and time

periods – continuing the example, being able to say 'Group V bronze spears are contemporary with Ewart Park 2 swords and are both found in the same areas'. Secondly, Adams & Adams (1991) have broken down the elements of a typology in order to enable them to be considered separately. The type concept itself is made up of two elements – type identity (a mental grasp of what the type members will look like) and type meaning (including such aspects as find location, context, associations, function and inferences). The type *description* will indicate, verbally or pictorially, as many of the known characteristics of the type as possible in order to convey type identity, while type *definition* notes the diagnostic attribute or attribute cluster that distinguishes that type from all the others and at least partially conveys type meaning. Therefore, it is the type meaning that is the crucial aspect that separates the typology from the classificatory system.

5.1.2 Typological method

There are several issues here relevant to good practice in the creation of a new typology. The majority of artefact groups relevant to this work are studied within established working typologies, rather than classificatory systems, and it is the creation of a typology for the iron spearheads which is desirable. In order for these typologies to be practically and theoretically useful they must have a stated purpose, which will enable the typologist to select the relevant intrinsic and extrinsic variables for analysis. It is worth noting that although complete objectivity in typological groupings is often described as the ultimate goal of the researcher (Adams & Adams, 1991: 8), it is this first step in the creation of a typology which is unavoidably subjective. Once variables are chosen, the identity of each type can then be established, although Adams & Adams argue that these types will be provisional until each is shown to carry meaning. Here they seem to imply that meaning is intrinsic to the types, while Watson (1973) argues that, generally, finding typological meaning is itself a hugely subjective part of the process, based entirely on individual, metaphysical interpretation of physical objects. Where no unambiguous patterning of certain variables such as chronology, regionality or associated material occurs, the latter argument is certainly more persuasive.

Once meaning has been applied to each type, the most immediate concern is how to convey the relevant information. Adequate type description that can sufficiently convey key information to a third party, such that the third party can accurately sort relevant material into the groups described, is noted by Orton (1980: 33) as an indicator of typological quality. Adams & Adams are more specific, stating that each type must have an associated label or name (usually numerical, alphabetical or site-related), definition and description. The definition of each type must identify the attributes or attribute combinations that distinguish the type from *all* other types, and should indicate both the norm and any known deviations from the norm which still fall within the type itself. Meanwhile the description must also identify the attributes that distinguish the type from *some* other types. While sounding obvious, each type must contain actual, physical members from the artefact population. This last point is particularly relevant where computer clustering software has been used to create groupings, since a common problem with this method is that theoretical groupings are created when no relevant artefacts may actually exist (Adams & Adams, 1991: 33). Finally, both Orton and Adams & Adams note that typologies and the type definitions within them should be, in almost all circumstances, clearly described as provisional since they may change as more material is discovered and added. A final typology or definition is only possible when it is clear that there is absolutely no more material to be classified.

In practice, the methodology behind most archaeological typologies is far less formalised and frequently opaque, with many apparently created purely by eye, on the basis of how visually similar the items are or using basic numerical information (i.e. number of rivets or edge hardness values). A more comprehensive approach suggested by Orton involves initially grouping material by eye and then creating sub-groupings based on numerical criteria; a process used by Swanton (1974), but not by subsequent authors such as Manning (1985).

Interestingly, neither Orton nor Manning proposed combining the statistical methods of classification discussed by Barker (1975) and Densem (1976), with visual classification. Klejn (1982: 30) hypothesises that a successful ‘working’

typology is one that correlates with another scheme that was created separately; perhaps by comparing the groupings achieved through independent visual and numerical/statistical analysis. An example of such correlating, 'working' typologies are those in use for LBA spearheads, which are discussed (and amalgamated) below.

Klejn's hypothesis is predicated on the assumption that there is a 'correct' typology, if only one could find it; therefore, should two typologies based on the same material deviate from each other in any way, he would consider both invalidated. The issue of whether a single, definitive typology should be sought, or whether a range of groupings are acceptable, is one discussed by Hill & Evans (1972: 252). The former goal is advocated by those taking an empirical view, on the grounds that all artefacts have an inherent meaning and therefore a 'correct' typology is possible. However, given the symbolic diversity, potential layers of meaning and the multi-functionality of many weapons, this approach appears too simplistic. Alternatively, 'positivists' hypothesise that artefacts only carry meaning that the human mind assigns, and can therefore have a multitude of different meanings. The multiple typologies that can result from the latter approach can be examined and compared in light of the interests and hypotheses of each researcher.

5.1.3 Key concerns with the use of traditional typologies

Several problems have been associated with traditional typological theory. Firstly, the archaeological record has at times been viewed as the "development of culture from an initial non-cultural starting point to ourselves" (Dunnell, 1978: 194). As Greenwell & Brewis (1909: 442) put it much earlier, they planned to view the evidence's "gradual evolution *from* the simplest forms *to* the highest stage it finally reached" [italics added by author]. There is no admission here that an artisan might, for whatever reason, make a simpler version of the thing they make, rather than create progressively more accomplished and complicated versions. Such a simplistic grasp of stylistic development will result in chronological mistakes and problems with understanding the cultural meaning of the material. This issue has long been identified and the implicit thinking behind it is

fortunately rarely in evidence when examining more modern work.

However, as touched on earlier, the thought processes and methodology behind many typologies currently in use are only rarely made explicit by the author. One must frequently assume an implicit methodology using morphological features to place the items into a series of groups, each member presenting that group's dominant feature, before determining the relevant information for each group, such as a date range and location. One of the key problems with this approach when publishing typologies is that the original purpose of the researcher will not be explicitly stated at the start, assuming there ever was a conscious and deliberate one. Adams & Adams (1991: 8-9) note that any typology will be valid if it serves its original purpose, but that if there is no expressed purpose it may well generate types that have no meaning. Further, future researchers will need to be aware of what purpose the typology was originally designed to serve, in order to be aware of what its uses and limitations are. Despite archaeologists' "propensity for wanting to develop single, all-purpose taxonomic systems, and then wanting to stick to them" (Hill & Evans, 1972: 236), one typology will rarely be able to fit all uses.

Finally, an issue with creating, or applying, a typology is that frequently an artefact will only *mostly* fit into one or other type; rarely will it be a classic example of a particular type that 'ticks all the boxes'. An example of this here would be BSP104, an LBA spearhead, that is classed as a 3 but the loops are vestigial and the midrib is pointed, rather than rounded.

5.1.4 Methodology behind the LBA swords typology

[Note: for the specific details of the typologies for each type of weapon, see Chapter 3]

The successive works classifying LBA swords act as a fascinating chronological chart of the increasing sophistication of both the typologies themselves, and what is expected of them, in the 20th century. The first classification system of bronze swords was published by Peake in 1922, dividing the group of material into 7

types labeled A-G. Although simplistic in its approach, it provided a starting point for subsequent researchers, including Brewis (1923), Cowen (1967), Burgess (1969) and Brown (1982), culminating in the seminal LBA sword typology authored by Colquhoun & Burgess (1988) (see chapter 3).

In addition to discussing the developmental drivers and functional aspects of LBA swords, Brewis (1924) provided a simplified version of Peake's work, dividing the material into 'earlier' and 'later' groups based on the morphological style of the hilts. By articulating his concern that the divisions between the groupings were ambiguous and open to subjectivity, he effectively extended an invitation to later researchers to build on the topic. There was a flurry of publications in the 1960s, the most important of which were authored by Cowen (1967) and Burgess (1969). Both were heavily concerned with identifying an accurate chronological framework, and both recognized the key differences between southern British and northern British pieces. The interest in applying specific chronology (and a possible genesis, in the case of Cowen) to the swords appears to be an implicit attempt to provide type meaning to the groupings discussed, some of which Cowen seemed to find worryingly weak. He noted that the appreciable difference between the Gündlingen sub-divisions seemed "nebulous" (1967: 409) and the specific placement of a sword in a particular group was a subjective decision, with the potential to distort distribution patterns. Cowen declares that said subjectivity can be mitigated by the experience of the archaeologist and notes that a large enough sample (potentially difficult with high-status metalwork from a relatively small geographical area) will cancel out errors of judgement. However, the observation itself suggested that a re-evaluation of sword sub-divisions, their type meaning, or type definition, might be appropriate.

Such a re-evaluation did take place (albeit in a limited form) in 1982, when Brown brought the examination of the swords out of the realm of chronological adjustments and returned to basic principles in questioning the validity of the existing type groups. Dismissing the normative practice of mainly classifying the swords using the hilt details, he makes a strong case for more careful consideration of the original choice of what constitutes a key attribute. He not only

discusses the importance of blade proportion and length, but also more functional aspects of a blade, such as its weight, point of balance and alloy composition. In order to analyse these attributes, and assess the validity of previous groupings, he subjected the groups to statistical analysis, mainly significance testing. Although his work does not substantially change the accepted typologies in place, it is the methodology which is of interest – Brown argued for a more holistic approach to sword classification, and in doing so was following a developing trend (Barker, 1975; Densem, 1976) of applying statistical testing to accepted archaeological theory.

The requirement to follow the *Prähistorische Bronzefunde* format necessarily inhibited explicit discussion by Colquhoun & Burgess (1988) on the methodology followed when compiling their catalogue *The Swords of Britain*. However, the text indicates that their groupings are based mainly on the form of the hilt, and owes much to the research discussed above. One of the key problems with the use of a single morphological feature, such as the hilt form, to determine which typological grouping an artefact falls into is that this feature may be absent if preservation is poor. This is ably demonstrated by the large proportion of material in the volume which are missing all, or significant portions, of the hilt. However, Colquhoun and Burgess' type definitions usually employ more than one key diagnostic feature; thus, although many fragmented swords must be designated 'unclassifiable', aspects of their blade size, proportion or section can allow at least some to be assigned to a type (i.e. Wilburton Unclassified or Ewart Park Unclassified), if not a sub-type. The discussion of type meaning for each group is excellent, drawing together seriation across the whole corpus, find location, context and associated material. Given this, it is unclear whether the authors placed swords (particularly the fragmented ones) within a group purely on their morphological identity, whether they used a combination of the morphology and the extrinsic variables identified in the type meaning or whether methodology varied.

If Colquhoun & Burgess did employ statistical methods to validate the groups there is no mention of it. However, the quality of their typology is attested by the fact that it has never been superseded in any general sense in the 30 years since its

publication. Subsequent work, such as Needham's (1998) re-evaluation of the stages and dates of the BA, may have necessitated minor adjustments but the groupings themselves are still widely accepted as functional.

5.1.5 Methodology behind the LBA spearheads typology

The Colquhoun and Burgess (1988) typology for LBA swords is still a first reference point for scholars today. Unfortunately, there is no equivalent for bronze spearheads, partly because they are the only major group of metalwork from the British BA that as yet is not covered by a *Prähistoriche Bronzefunde* series. However, various authors (Greenwell & Brewis 1909, Coles 1960, Bridgford 2000, Davis 2006) have developed regional classifications of bronze spearheads dating from the entire BA (and reflecting their personal research interests), or adjusted others' work. As with the swords, these works were concerned with distinguishing indigenous and continental development, relative chronologies and, occasionally, function.

Greenwell & Brewis' work is a comprehensive critique of previous spearhead analysis from Britain and Ireland, examining the initial introduction of bronze into Britain and establishing 13 groups of spearheads. These were believed to have developed indigenously, each group usually distinguished by the method of attaching the spearhead to shaft. In keeping with the theory that the evolution of material culture would develop only in one direction towards a more efficient form, each successive group demonstrated a more secure method of attaching the shaft. No attempt was made to provide dates or 'type meaning', but the aim of placing the spearheads within a wider, European context, and the broadly evolutionary perspective taken, make Greenwell & Brewis' work inherently typological. Although not without criticism and various attempts at adjustment, Davis (2006) argues that the Greenwell & Brewis groupings have never been satisfactorily superseded by any subsequent version.

The Greenwell & Brewis (1909) model was later modified in its chronology by Coles in his 1963 work on Scottish MBA metalwork, in which he created a six

group classification, labeled A to F. This work did not establish any new categories, but did revise the existing chronology by suggesting that the side-looped material was earlier than the basal-looped examples, based on the hoard associations of key examples (1963: 108-110). This is particularly interesting as it stands as an example of the use of external validators for typological groupings. Importantly, although discussing spearheads of earlier date than is relevant here, it was in this work that he agreed with Coffey (1893-6) and Evans (1933) that the form of some of the later material was a result of the fusion of indigenous forms and the continental 'leaf' forms, but that some significant developments in form could not be explained by continental influence (1963: 110). Ehrenberg (1977) agreed that the development of the British LBA spearheads was indigenous but believed that the precise chronology and relationship between the types was no longer valid and produced a seven-group typology.

Davis (2006) and Bridgford (2000) both implicitly use the Coles taxonomy as a starting point but attempt to resolve various problems almost by starting afresh with their classifications. Using Needham's (1998) work, in which he used metalwork, pottery, settlements and radiocarbon and dendrochronological dating to divide the BA into 7 stages, Bridgford (2000: 13) was able to designate spears with loops near the opening or middle of the socket to be too early for inclusion in an LBA data set. Those with one rivet/peg through the socket or loops at the base of the blade were identified as LBA in date. These LBA spears took five forms: lanceolate, flame-shaped, ogival, barbed and triangular. Other characteristics include basal loops (only in triangular, lanceolate and flame forms), dumpiness, openings, stepped profiles, fillets, channels, hollow casting, straight bases and midribs (2000: 13, 132). However, these classifications are complicated, both within Bridgford's own work (where sub-divisioning relates to features such as steps, dumpiness and fillets, which can be found across a number of different groups), and between the works of different authors. Furthermore, the descriptive approach to labelling spear types lacks uniformity in application in various works, making it difficult to synthesise the results and findings of different authors.

Davis' 2006 work on basal-looped spearheads also employed the main criteria for

classification used by previous authors in his own typology: his diagnostic attributes are the position of the loops and the form of the blade. However, other attributes of relevance include the quality of workmanship, decoration, rivet holes and distribution. He also used Montelius' method of organisation to place the classification into chronological order, through context (2006: 29). As such, only three of Davis' 8 groupings are chronologically relevant to this study – some of the type 6 triangular form, the type 7 narrow channel form and the type 8 late Scottish/Irish. Again, there is a belief that the two earlier types are the result of insular developments influenced by the continent but that the latter, Scottish examples are a purely indigenous stylistic development, possibly the revival of a local archaic form (2006: 52).

Having examined this range of taxonomies, it was of interest to determine whether they were compatible and whether date ranges could be applied to the groupings. Subsequently, those spearheads dating to the LBA could be identified as relevant to this study.

Greenwell & Brewis classification	**Coles Classification**	**Ehrenberg Description**	**Bridgford classification**	**Davis classification**
Class I	A	Tanged		
Class II	B	End-looped		
Class III	C	Kite shaped		
Class IV	D	Side looped		
Class IIIa	E	Basal looped	Basal looped	Basal-looped: triangular (type 6), narrow channeled (type 7) and late Scottish Variants a and b (type 8)
Class IVb	F		Tear shaped	
Class V,Va, Vb	-	Pegged	Pegged lanceolate	
Class Vi	-	Barbed	Ogival	

Table 13: Classificatory systems applied to British Bronze Age spearheads

According to Bridgford (2000) and Davis (2006), the basal looped spearheads date to the Middle to Late Bronze Age (1520BC – 1040BC), while the riveted

examples fall clearly into the LBA (1310BC – 840BC) (Bridgford, 2000: 13; Davis, 2006: 53). This is the first tentative dating there is for these examples, although evidently the date ranges are so large as to be of little practical use. Further work examining find context and associations may be able to remedy this situation and provide more nuanced dating, but that is outwith the scope of this study.

Fortunately, the above synthesis can at least indicate that the various groups of spearheads relevant to this study are:

1. Classes IIIa, IVb, Va, Vb, V, Vi (Greenwell & Brewis, 1909)
2. E, F (Coles, 1960)
3. Basal and protected loop, pegged, barbed (Ehrenberg, 1977)
4. Tear-shaped, pegged lanceolate, ogival (Bridgford, 2000)
5. Groups 6, 7, 8 (Davis, 2006)

As the above classifications can clearly be correlated with each other, the indication is that these systems are at least functional. However, in order to avoid confusion it seemed appropriate to apply as simple a classification system as possible to the database of this study, in order to be understood by other researchers, no matter whose classification system they might be most familiar with. That system is presented in section 3.3.2, Table 4, although the intention is certainly not to break any new ground in the classification of bronze spearheads, only to synthesize and clarify existing analysis.

Given the position of groups 7 and 9 in the series, and given the large and uniform date ranges, I have assigned a date range, within my own database, of 1,310BC – 840BC to groups 7 and 9 as they were the only groups that seemed undated by Bridgford (2000) and Davis (2006). The following descriptions are drawn from Davis' work (2006):

Anderson System	**Description**
1	Projecting basal loops, triangular form (according to Coles

	occasionally leaf shaped), generally long (about 12-15inch), maximum width found at 14% or less up the blade from the blade/loop junction. Often has circular midrib and rectangular loop plates. Ribs are aligned to the blade edges.
2	Close to above, but with narrow channels formed by the ribs running from the loop plates to the tip. Ribs are aligned to the midrib.
3	As above, but the key diagnostic is a fine finish and high level of workmanship. Also features a curved base, narrow channels and large incorporated rectangular loops.
4	As above, but the key diagnostic is a fine finish and high level of workmanship. Also features a horizontal base, narrow channels and large projecting rectangular loops.
5	Ribless, protected loops (small, about 1 inch from base), leaf or ogival in form, narrow sockets, long.
6	Riveted leaf shape with wings on either side of the midrib socket.
7	Riveted socket with a hollow head.
8	Riveted leaf form.
8	Barbed.

Table 14: Anderson classification of LBA spearheads of northern Britain

5.1.6 Methodology behind the IA swords typology

Perhaps understandably, given relative numbers and preservation, there has been rather less work devoted to the iron swords of Britain than the bronze examples. The first published work on this group of artefacts (Thurnam, 1871) was essentially a basic list of extant examples, which included swords from Yorkshire as well as those from the rivers Thames and Witham. Franks' (1880) work included illustrations and divided the, admittedly very small, dataset into four groups. These were discussed in context with European finds and were divided on the basis of location or the material of the scabbards.

Much discussion took place during this period, and the subsequent decades, on the

source of these weapons and their relationship to European material (Smith, 1905; Déchelette, 1914; de Navarro, 1936), always in relation to their La Tène terminology (Stead, 2006: 1). It was not until 1950 that Piggott, who by that time had a considerably larger corpus to work with, undertook a study of specifically British and Irish swords, scabbards and daggers. These were divided into six groups (one of which was apparently created for a misidentified object, which was later discovered to be part of a shield rather than a sword), based on their provenance or stylistic derivation. Subsequent work, suggesting that Piggott's research on southern British material might benefit from being more closely linked with La Tène phases (Spratling, 1972), was unfortunately never published.

The tripling of known material over the last forty years, combined with Spratling's typology remaining unpublished, was the impetus for Stead to begin work on a catalogue and typology of swords and scabbards from across Britain; this was not published until 2006. Although departing from the established practice of writing about the weapons in direct relation to Continental examples (Stead's volume uses that material as background reference), the division of northern and southern weapons noted by Piggott, and endorsed by MacGregor in 1976, was shown to be sound. Stead created a 6 group typology of swords, labeled A to F, where the type definition feature primarily employed was the length of the blade. Piggott found the development of swords north and south of the Humber in the pre-Roman period to be separate; the northern swords were shorter than their southern counterparts and there was no clear distinction between short- and medium-length blades. Happily, this division was very unambiguous, with only one longer, southern type blade found in northern Britain (considered an outlier). A further two groups were added to provide a home for those Roman-era weapons showing a fusion of northern and southern features and for the swords with anthropoid hilts. Of the final 8 groupings, only E and F (the northern types), G (the anthropoid swords) and H (those with both northern and southern features) are relevant to this study.

The practice of making scabbards out of metal during this period adds to the range of possible diagnostic features in the creation of a typology. Consequently, the

positioning, type of metal and general shape, of the scabbards, suspension loops, chapes and decoration can be added to blade length and hilt end morphology; the morphological features of the blades themselves are relatively homogenous in the north (where preservation has left them decipherable), and so it is primarily the hilt ends, in conjunction with the other features, that determine grouping for the northern swords. This is therefore the only group of weapons of interest to this study where material that is not strictly part of the weapon itself forms a crucial part of the weapon's typology. Each feature is associated with its own typology developed by Stead, and specific combinations of these are grouped together to form the type description (for example, Group E swords are those where the sword is type VI, the scabbard is type W or X, the suspension loops are type 7, the chapes are type F or G and the art stages are IV and V). Like Colquhoun & Burgess, Stead bases the typology itself on intrinsic features, but unlike them he also explicitly discusses the importance of context in developing type meaning, noting contextual patterns within the groups. Thus, Group E swords tend to be found in crouched inhumations, while Group F swords have more varied contexts including burials, hoards and loose finds.

Stead's typology contains a basic level of chronological ordering, with Group E described as earlier and Group F as later, which does roughly demonstrate the overall development of the northern swords, but there are several problems associated with its use; primarily, that this chronology leaves northern British weapons unrepresented at either end of the IA. The cultural reasons for which one might expect a low volume of iron weapons between 750BC and 200BC are discussed in chapter 1, but the fact that there are none that have been dated to this period or the period AD100 – 400 is surprising. The reason for the chronological gaps are explained by Stead himself when he notes that the chronology had to be based heavily on the typology itself, due to the dearth of associated material that can be dated independently. This is unfortunate, as the subtlety of the groupings are limited by the few combinations of distinctive attributes in any one artefact from this area and period. The inability to further subdivide the material meaningfully means that any associated chronology will either contain overly large date ranges or leave gaps. Therefore, although some guidance on dates is

welcome, the chronological ordering of the typology should not be considered its most important aspect.

5.2 Iron spearhead case study

There has been very little general work looking at Iron Age and Early Historic spearheads (see chapters 2 and 3). There are several reasons for this; other metalwork, frequently swords and brooches, seems to carry more mainstream interest, there is a relatively small dataset to work with, the material is often very badly preserved, and so on. Neither has there been an attempt to catalogue or classify the native iron spearheads of northern Britain – the closest studies are those of Stead (1991a: 75), who proposed a basic division of the spearheads found in east Yorkshire graves, Swanton (1974), with his corpus of Anglo-Saxon spearheads and various authors looking at Romano-British material (Brailsford, 1962; Barker, 1975; Densem, 1976; Scott, 1980; Manning, 1985; Marchant, 1990). As a result, the extant iron spearheads of northern Britain, of which there are 120 still extant, constitute a mass of material whose components cannot be considered relative to each other, adequately analysed or placed within a wider context. In general terms, this chapter hopes to advance the research position in respect of this material.

An issue for any classification system or typology is the population size that it is based on. The dataset available to Swanton (1974) consisted of 2,080 items, while Manning (1985), who was only working with 101 artefacts from a single site, created a classificatory system rather than a typology proper. The size of this dataset should rightly suggest caution regarding any conclusions reached using such a relatively small data set. However, with that caveat in mind, any clustering that the range of methodologies employed throw up should be considered until further finds enable a re-evaluation of the material as a group.

5.2.1 Objectives

The dangers of placing material in order as an end in itself have already been noted. The results of such unfocused attempts are unlikely to be of use when

subsequently applied to a specific problem, such as identifying regional patterning, because their design does not fit the problem. Therefore, it is important to have a more specific, explicit aim which will inform the process of classification. Formally put, this research has a 'basic historical purpose', using a combination of intrinsic and contextual variables to provide information on the morphology, chronology, regionality, function and social meaning of iron spearheads.

A primary aim is to identify functional and stylistic patterns within the population. The link between morphology and functionality in iron weapons is harder to identify than with bronze, given that it is far harder to create a high degree of complexity when working iron, than when casting. Furthermore, the preservation of iron in the archaeological record is often extremely poor. However, it is hoped that patterns of attributes viewed from a functional perspective will yield an indication of the range and changing nature of combat behaviours in the IA and EHP. The shape and size of the blade, the point morphology, hafting arrangements and other attributes will affect the most efficient mode of use for the spear, whether that be thrusting, throwing, stabbing or slashing. Swanton (1974: 2), Barker (1975) and Manning (1985: 161) all discount the socket of a spearhead as being of any relevance to the creation of a typology, on the grounds that only the blade would have any functional importance. Manning goes further and states that the design of the socket relates purely to hafting arrangements and will therefore not be responsive to either fashion or the function of the spear itself. However, disregarding the socket as an integral part of the spear itself would be a mistake on two grounds. Firstly, Densem's 1976 results of PCA analysis on Roman material suggest that the three most important measurements in the creation of spearhead clusters are blade width, blade length and *total length*; that is, the spear blade and spear socket length together. Secondly, it is clear that there *are* instances of sockets being responsive both to function and fashion. The lower part of the Roman pilum was integral to its effective function (Marchant, 1991: 265), while the pairing of small and rounded blades with excessively long shafts on a number of the South Cave spearheads suggest a greater preoccupation with fashion than function. Therefore the inclusion of sockets in a functional analysis seems more beneficial than not.

From a stylistic perspective, groupings of recurrent features associated with a particular geographic area, but not others, would indicate the emblemic style of a cultural group, allowing the size, location and overlap of groups to be mapped. In addition, given the effect on emblemic style of socio-economic stressors noted by Wiessner (1983: 271), the speed of change of these features might in ideal circumstances allow periods of conflict to be charted. Other features within these style-based groupings are likely to be assertive stylistic attributes and their variation (or lack thereof) will indicate how much cultural uniformity was permitted within the group. Unfortunately, it is more likely that the difficulties associated with such a small sample size will be more pronounced when considering the material from a stylistic, rather than functional point of view; while functional conclusions can realistically be drawn from a single example, a grasp of stylistic subtleties requires a substantial number of well-preserved, correlating examples. The techniques employed here are therefore more likely to provide meaningful functional, rather than stylistic, results.

Finally, in order to identify how stylistic and functional patterns may change over time, there must be an indication of the relative chronological positioning between clusters – as Adams & Adams (1991: 10) point out, "each new find must be located within a time and space grid before the data can be used for any other purpose". Of the extant spears, 82 have a rough date-range assigned to them through their associations or context, although these are not unproblematic. Firstly, these date ranges were assigned through too indirect a route for reliability, and secondly, 34 of those date ranges are of 300 years or more; this problem is most noticeable in the large group of material coming from Garton Station, where all 32 spears, despite significant variation between them, can only be dated to 200BC – AD 100.

Traditionally, the creation of a typology would not just place the material in a more nuanced order, but could place all the material in clusters which, while they may have relatively wide date ranges, will contain spearheads that are included on their own attributes, as well as their associations. Further, it will ideally be

possible to place new finds, and older finds without context, within the typology. Such date ranges can be achieved through a process that Gardin (1980: 84-90) calls ‘solving for an unknown’; when creating a historical typology, types will be differentiated by a range of variables, usually morphological, based on the theory that these types will have different date ranges. It is then the job of the typologist to use techniques of survey, stratigraphic excavation and absolute dating to determine whether the groups do indeed have different date ranges, and also what those were. For this reason, representatives from some clusters (not all clusters contained examples suitable for testing) were radiocarbon tested to validate the potential date ranges suggested by pre-existing methods; which, given the provenance of many of the spearheads, are tenuous.

Given the range of outcomes required, and the range of methods available to achieve them, it is clear that a positivist approach is required. It is hopefully also clear that the creation of a typology simply for its own sake is not a primary aim of this chapter; it is a tool to achieve those aims. The following will be an exercise in applying methods, or combinations of methods, to fit particular problems or resolve limitations of the dataset. It is to be hoped that the results will at least partially answer the research questions. It is also to be hoped that, should an appropriate typology be produced, it will enable further research, although it is not intended to be definitive. It must clearly be provisional, to allow for the possibility of further finds affecting results and for the creation of other typologies depending on prevailing research needs and interests.

5.2.2 Application of visual and numerical methods for simple functional typologies

Adams & Adams (1991) note that when a typology is created it is usual for the identity of the types to be established first (by selecting intrinsic attributes relevant to the purpose of the typology), while the meaning is subsequently discovered by identifying common patterns relating to the extrinsic variables. This method is appropriate when the purpose of the typology relates to functionality or style; the relevant variables will all be intrinsic, (size, morphology etc) while subsequent patterns in the extrinsic variables, such as context and associations, provide

meaning.

The simplest, and most subjective, method of grouping the material is the sort of visual division employed by Stead (1991a: 75) in relation to the spearheads from east Yorkshire burials. Before attempting an entirely new set of visual groupings, it was of worth to investigate whether Stead's classificatory system could be applied to the spearheads of northern Britain generally. It is unfortunate that no specific divisions were given; group A (21 spearheads, 41% of the total) was described as having a “relatively low maximum width”, while group B (30 spearheads, 59% of the total) has a “higher maximum width” (1991a: 75). Consequently, a degree of subjectivity was required in determining into which group each spearhead should be included. This classificatory system would have no wider purpose other than descriptive division, were it not that 85% of group A were found in Rudston and Burton Fleming and 97% of group B were found at Garton Station or Kirkburn. This regional difference suggests that these groups had some degree of type meaning, at least within east Yorkshire.

Unfortunately, although a small degree of patterning is discernible when Stead's classification is applied to the wider spearhead population, it is not nearly as consistent as it is in east Yorkshire. 92 spearheads were complete enough to be analysed, with 43 (47%) as group A and 49 (53%) as group B:

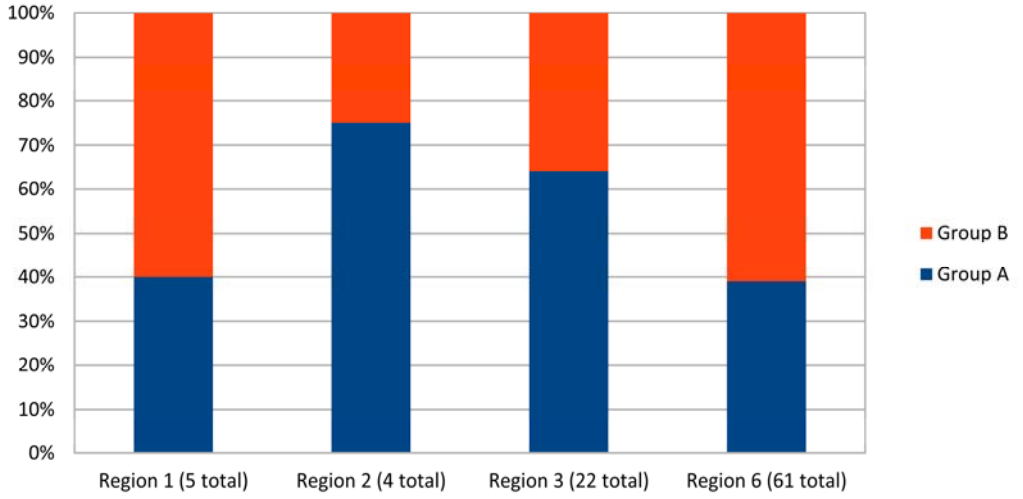

Illustration 16: Relative percentages of Groups A and B within each region of northern Britain [note: no classifiable examples were found within regions 4 and 5]

Although group A was more likely to be found within regions 2 and 3, and group B within regions 1 and 6, patterning for regions 1 and 2 are based on very small numbers of finds. Furthermore, the strongest pattern (¾ of all spearheads found in region 2 are group A) is not as strong as the weakest pattern seen in east Yorkshire.

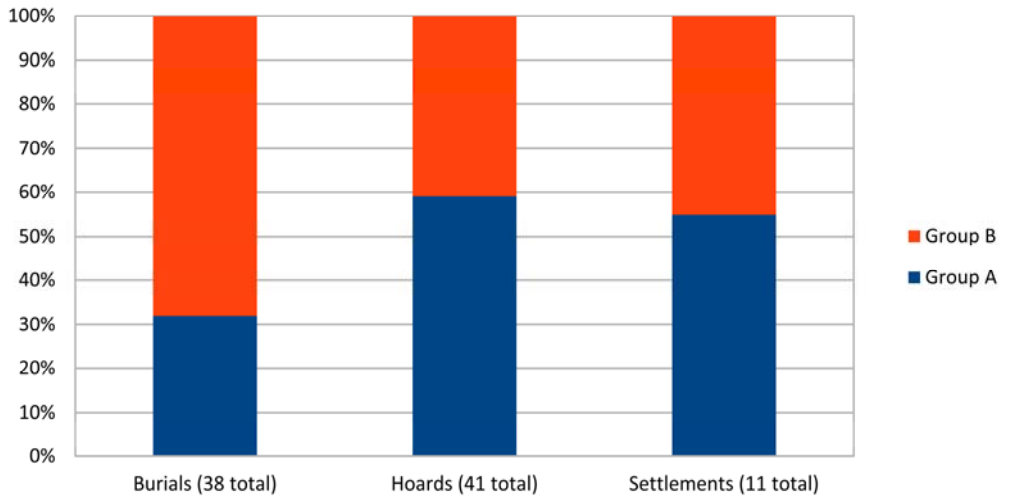

Illustration 17: Relative percentages of Groups A and B within depositional contexts

By definition all of Stead's spearheads were from burial contexts, but there was no strong contextual differentiation between the two groups when applied to a wider range of contexts. Although group B spearheads are slightly more likely to be

found in burials, while group A spearheads are slightly more likely to be found in hoards or on settlements, the strength of these patterns are even lower than those seen in relation to regionality. Consequently, it does not appear that Stead's division of spearheads from east Yorkshire burials can be meaningfully applied to the spearhead population of northern Britain as a whole.

When the entire population was examined visually the material could be divided into 5 clusters, with a further group containing unclassifiable examples:

Group 1: 38 examples (36% of the classifiable population)

- Description: small, dumpy, frequently angular blade; often the blade is shorter than the socket
- 'Definition': blade is shorter than 100mm, socket is shorter than 100mm, total length is shorter than 150mm. Generally, the blade is shorter than the socket.

Group 2: 25 examples (24% of the classifiable population)

- Description: medium length, slender blade; blade is equal to, or longer than, the socket
- 'Definition': blade length lies between 60mm and 170mm, socket length is less than 100mm, the blade is usually longer than the socket. The maximum blade width should not be more than 40% of the length.

Group 3: 14 examples (13% of the classifiable population)

- Description: medium length, broad, flat blade; blade is equal to, or longer than, the socket
- 'Definition': blade length is less than 100mm and socket length is less than 100mm, socket, the blade is usually longer than the socket. The minimum blade width should be more than 40% of the length.

Group 4: 17 examples (16% of the classifiable population)

- Description: small blade; very long and slender socket
- 'Definition': blade length is less than 100mm, socket length is more than 200mm and not more than 25mm in diameter.

Group 5: 12 examples (11% of the classifiable population)

- Description: long blade; short socket; frequently straight or very gently tapering sides; pronounced midrib. Similarities to several of Swanton's groups of Anglo-Saxon spearheads.
- 'Definition': blade length is more than 200mm, socket length is less than 200mm. Maximum blade width is less than 25% of blade length.

Miscellaneous Group: 4 spearheads unlike any other group

- ISP20: Similar to Swanton's K1 group; very angular, pronounced midrib, concave upper blade edge
- ISP 23 and ISP 147 pyramidal blade form, reminiscent of medieval armour-piercing arrows although find context makes misidentification unlikely
- ISP183: socket similar to Group 4s, blade similar to Group 3s, but the tip extends in a very long, narrow point, nearly doubling the whole length of the blade.

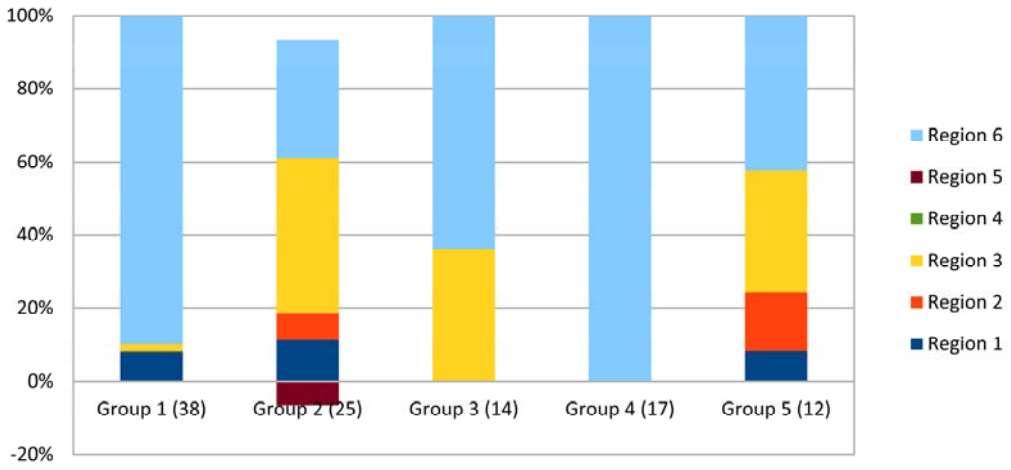

Illustration 18: Regional distribution of visual groups

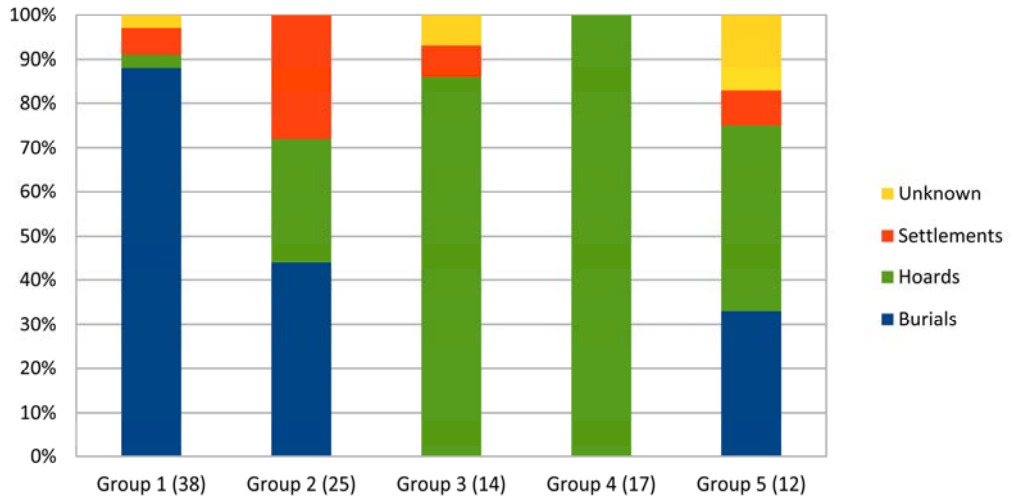

Illustration 19: Find contexts of visual groups

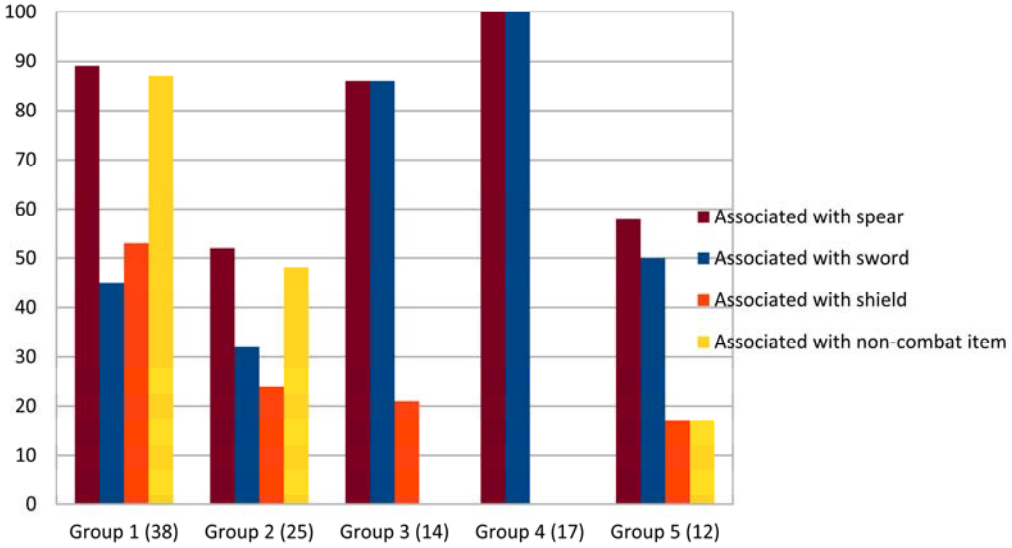

Illustration 20: Associations of visual groups

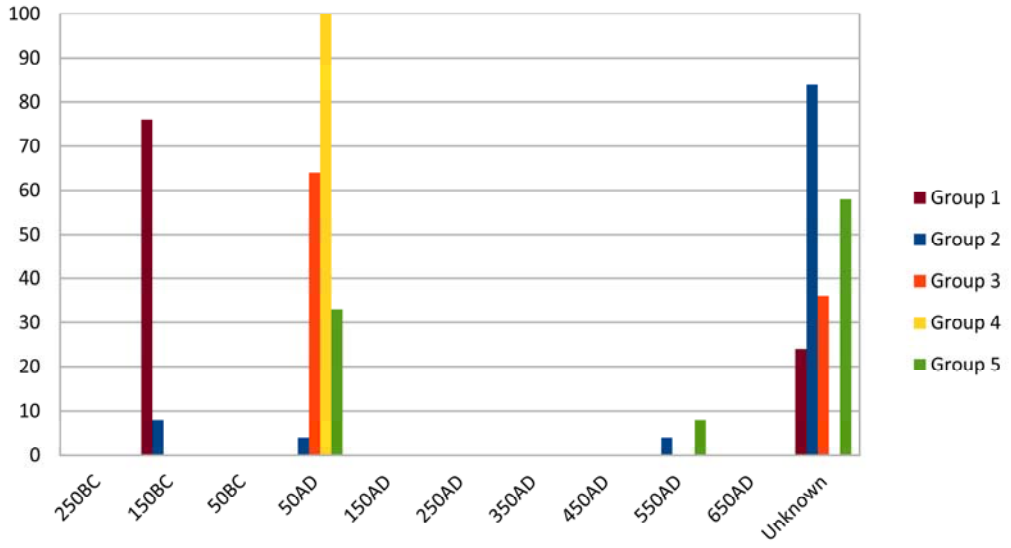

Illustration 21: Date ranges of visual groups

These graphs can provide a range of further information on the spearheads. In terms of regionality, Region 6 contains examples of all the types of spears evident while region 4 contains none. These opposing extremes may be the result of actual regional differentiation during this period, differing depositional, preservation and survival factors or a combination of these. Region 5 only contains Group 2 type spears, which may also be due to these factors, or may be an indication of cultural preference for limited variation in weapons. Groups 2 and 5 are widely distributed, however, suggesting that these at least are not emblemically or functionally related to particular cultural groups or areas, but Groups 4 and 3 do have regional significance. Group 4 is only found in Region 6 (although since all members only come from one site, it will only be possible to determine whether this is significant if spears of this style are found elsewhere in Region 6 or in other areas of northern Britain). Group 3 is interesting in that it appears to relate to Regions 3 and 6 almost equally. However, a large proportion of its members again only come from the single South Cave site, distorting the regional distribution. If one therefore considers that Group 3 focuses exclusively on Region 3, but that a large group of these were found together with diagnostic spears from Region 6, it suggests the possibility of a particular cultural link or event to account for it.

Given the issues associated with Group 4, the main groups whose contexts are most consistent, and therefore of interest, are Groups 1 and 3; where contexts for

these weapons are known, they are always found in burials or hoards respectively. Group 1 members found in burials are mainly those from Region 6, suggesting that leaving these small weapons in the grave had more to do with cultural practice than the function of the weapon in particular. Group 3 spears with a hoard context are dominated by the Traprain Law and South Cave finds, the former site a hilltop enclosure and the latter in the immediate vicinity of one, indicating a degree of complexity in terms of the link between hoard content and context.

The high level of material from all groups found with associations suggest that very few of these weapons would have been entered the archaeological record through accidental loss; in turn, the contexts can be accorded more weight due to the deliberate nature of deposition. The range of contexts of the groups may indicate whether some groups were functionally designed as combat weapons or for some other purpose. The crucial issue is whether the spears are proportionally more likely to be found with other spears and non-combat items (such as beads, bone, pottery and so forth) or whether they are proportionally more likely to have been found with swords and shields. The former may suggest a domestic use, while the latter undoubtedly at least references combat and warfare. Groups 3 and 4 were deposited exclusively with military equipment, while Groups 1, 2 and 5 have varying degrees of association with non-combat items. It is possible that these differences are solely due to depositional context, since Groups 3 and 4 are also almost always found in hoards, while the others exhibit a more even range of depositional circumstance. However, were depositional context the key indicator of associated material, one might expect Groups 2 and 5, which have similar contextual ranges, to also have similar proportions of associations. This is not the case, with Group 2 containing a relatively high proportion of non-military associations and roughly even proportions of associated material. In contrast, Group 5 has a high number of associations with swords and spears, but low number of associations with shields and non-military items. Therefore, the associated material of a weapon may, to an extent, be considered a functional indicator: that of Groups 1 and 2 suggest an emphasis on domestic use, while the associations of Groups 3, 4 and 5 indicate a more military context.

The date for each item was obtained by taking the date-range assigned (i.e. 200AD to 400AD) and using the middle point as a single date (continuing the example, 300AD). The graph above is interesting in that it indicates a rough patterning in terms of the chronology of the groups. Group 1 is the earliest (around 150BC), Group 2 appears to have a very long period of use (through the IA and EHP), although this is at least partly due to a particularly high number of examples with an unknown date. Groups 3 and 4 are a little later than Group 1 (around AD 50), while Group 5 spearheads are both contemporary with Groups 3 and 4 and found dating to the EHP. Unfortunately, there are numerous problems with this approach: not only is the graph unable to indicate the width of the original date ranges of the spearheads, but those date ranges themselves are unreliable in light of the discussion on Stead's chronology of iron swords. Furthermore, the very high number of weapons originating from one site, or cluster of sites, has a profoundly distorting effect on the data. However, this is only intended as a rough indication of the chronological spread of the groups, and in this does not provide particularly surprising results.

Despite a range of potentially interesting information arising from these groups, there are three distinct problems with them. Firstly, as touched on above, the particularly high number of weapons from the single deposit of South Cave may have produced a distorting effect on the groups, since Group 4 is constituted solely of material from that site, while Group 3 has a very large proportion of members from the same site. The inferences and meaning assigned to Group 4 from its context and associations must necessarily be treated with caution until further examples of the type are found elsewhere. Secondly, a type definition should identify the attributes or attribute clusters that distinguish that type from all others. Because the material of this dataset lies on a continuum of morphological variations, it is possible to find a number of value *ranges* (i.e. "spearblades measure between 100mm and 200mm") that best fit a type, but there will always be outliers; consequently, it is the role of the researcher to decide where those outliers belong. In some cases it will be clear to which group a spearhead belongs, while in others it may require some subjective, informed judgements. It is patently not possible to achieve an adequate type definition, and thereby remove all

subjectivity, when using a visual-based methodology of classification. Thirdly, the aim of this process is to produce a typology, rather than a classification; although type identity has been established, and the graphs above show interesting *trends* within and between groups, it is debatable whether there is sufficient type *meaning*. Certainly the groups themselves do not evidence reliable chronological, regional or contextual patterning, but the question is whether the *attempt* to find type meaning makes it a typology, or whether *actually* finding type meaning makes it so. The former position seems valid here, as not only do the trends exist, but even where definitive group patterning cannot be found, the work of searching for it can still illuminate the material under discussion. However, clearly there is still room for improvement in the issue of type meaning. Therefore the main benefit of these groups is to provide some indication of IA spearhead styles, a framework to swiftly convey morphological information and some general conclusions regarding the material.

Turning to how these issues might be resolved, the first is one that results from the nature of the dataset itself, so there is little that can be done to ameliorate it, other than remaining aware of the effect. The lack of specificity in type definition and inherent meaning in the groups, however, could be the result of an undirected methodology and so the above groupings might be more useful when considered in conjunction with groupings produced by numerical methods, where measurements and combinations of measurements can be used to divide the dataset. A simple version of this approach, plotting blade length against blade width, was used by Manning, with the diagnostic identities of the resulting clusters formed using size, shape and quality of manufacture. Although the result is less subjective grouping, the methodology itself is too simplistic to consider and convey the nuances of shape involved, which the eye automatically classifies. Since this method is based on the conjunction of two particular variables, it will automatically miss a number of others that might well be relevant and limits the complexity of the resulting clusters. It is this problem that Barker (1975) and Densem (1976) sought to overcome, using statistical methods. Barker's use of multiple blade measurements (where available, given the preservation status of many of the objects), converted to ratios, provide a more realistic sense of blade

shape, although the complexity of the resultant groupings increases exponentially with the level of informational input. In turn, Densem sought to reduce that problem using Principle Component Analysis (PCA), which assigns more weighting to the key measurements. Fortunately, the last decade has seen an explosion in statistical software applications, which can find relationships between multiple variables, both intrinsic and extrinsic, with the weighting and significance of the relationships an integral part of the mathematical formula. Therefore, the next logical step is to determine whether the visual groupings achieved here will in any way overlap with those achieved through focused, statistical methods.

5.2.3 Statistical analysis

"There were morphologically distinct classes recognisable to the eye which on analysis demonstrably had no organisational integrity" (Binford,1972: 92)

"All we had to do was use the proper statistical methods, and we should be able to specify in concrete terms the associational clusters" (Binford, 1972: 92)

During the 1970s, various researchers (Smith, 1974; Barker, 1975; Densem, 1976 etc) recognized the potential benefits of applying computing software packages to the problems of archeological typologies and classification. The theory was that statistically generated typologies would be free of the many key practical and theoretical difficulties associated with the process, notably the subjectivity and personal bias involved in more traditional methods (Spaulding, 1982; Whallon & Brown, 1982). Unfortunately, some of these problems proved intransigent – the researcher still had to decide which variables to use in statistical analysis, after all – and the use of algorithmic techniques became less prevalent for some time.

More recently, perhaps in part due to increasingly sophisticated software like SPSS, the advantages of statistics are being recognized again – specifically, the use of a method called ‘Two-Step Clustering’ (Cool & Baxter, 1999; Jones, 2011). The advantages are various: the software can analyse large combinations of both intrinsic and extrinsic variables at a far faster and more sophisticated level than a

human mind. It can also indicate levels of significance and strength of association between variables, which makes the whole process more quantifiable and less subjective. Unfortunately, there are also drawbacks, including the potential for an unmanageable number of types to be identified. Additionally, the software will indicate associations between variables but cannot indicate the *causes* of non-randomness – in other words, it will show us significant relationships, but not *why* they are significant. Thus, the researcher not only has to try and work backwards from the results of the analysis to find the causes of the relationship, but also filter out those relationships that are causally linked and therefore not meaningful. Finally, there are issues not just with the software itself, but with whether certain material lends itself to being analysed in this way. Commenting on Romano-British spearheads, Marchant (1991: 279) notes that the overriding impression of this group of material is of diversity, rather than uniformity; his argument that there was no central area of control for spearhead production, and that consequently any resemblance between individual examples was purely coincidental, would suggest that the majority of simple statistical methods, which rely on specificity of measurement, are inapplicable to such a dataset. Practical and artisanal aspects of the forging process would indeed have limited the degree of standardisation that could have been achieved in the IA and EHP, just as it did in the LBA, but it does not necessarily follow that there was no intention to create a particular type and no way to recognise one. Suggesting otherwise indicates the extremely unlikely view that there was no identifiable stylistic or functional differentiation in a particular group of objects over the course of nearly a millennia. However, Marchant's argument of micro-variability in spear morphology does have a degree of validity and therefore has two key implications for the analysis undertaken here. Firstly, statistical software that can work with whole groups of measurements at once, ratios, and descriptive variables, will be far more effective than simpler approaches which rely on individual specific measurements. Secondly, any meaningful groupings of iron spearheads is likely to have to pinpoint the most appropriate division points along the continuum of morphological variation, rather than be able to identify very distinct and discrete clusters.

5.2.4 Two-step clustering (TSC)

The application of statistics to archaeological data, through the use of a programme such as SPSS, is becoming more and more common (Cool & Baxter, 1999; Jones, 2011). One of the reasons for this is that such applications can produce vast amounts of data and information extraordinarily quickly, whereas manually undertaking such work would be time-consuming and deeply complicated. Primarily, it can mine the data on a set of variables to produce cluster analysis; this will indicate whether what appears to be a generic mass of spears does in fact contain groupings, that may or may not be visible to the naked eye. However, if the results are to be reliable, it is important to gain an understanding of how the programme works, and why it works, before beginning any analysis.

Even before analysis takes place, it is crucial to ensure that the database to be clustered is appropriate to the software. The most crucial aspects of this include ensuring that all data is sorted correctly as nominal, ordinal or scale and ensuring that the computer can distinguish between variables with missing data and variables that have an actual value of zero. Mistakes made in this early stage will distort data output and invalidate any clusters generated, particularly in the latter case as objects with missing data are deleted from the analysis altogether in the first stage of the TSC process, marked as 'excluded cases'. Where the dataset itself is small or has considerable levels of missing data (either through lack of provenance or poor preservation), both of which are relevant here, it is particularly important to ensure that as many cases are available for analysis as possible. Another pitfall, which may be particularly relevant in the context of an archaeological database, is that the programme must have a single numerical value for each data entry in order to be processed; it cannot analyse date-ranges, example. In order to overcome this, single dates had to be obtained using the same method as that for the graph of dates for the visual groups, again with all the associated problems. Clearly this is a blunt tool, particularly when the original date range is large, but it does at least allow the chronology of the artefacts to be included in the analysis.

Cluster analysis works by grouping cases (artefacts) together, based on the levels of similarity or difference between specified variables. One of the key benefits of TSC is that the first stage in the process allows mixed data types to be analysed at once - categorical and continuous data can be used together in one calculation. This first stage involves using a sequential approach, whereby the data is scanned object by object and (on the basis of distance criterion) placed either in a previously formed cluster or starts a new cluster on its own, resulting in a 'cluster feature tree' of progressively diverging groups of material. Taken to its limit, it results in every single object within the database forming its own cluster.

Once these sub-clusters are obtained, traditional agglomerative hierarchical clustering methods can be employed to achieve a suitable number of clusters. This process involves essentially reversing the process of making the 'cluster feature tree'. It uses an algorithm to merge the clusters that have the highest level of similarity with each other. This leads to progressively larger groups, which are also progressively less similar, until one cluster remains containing all the objects in the dataset. A facet of the second stage of TSC, Akaike's Information Criterion (AIC), then assesses the range of multiple cluster solutions and automatically determines the optimal number of clusters for the dataset. This also helps to prevent unmanageably large or meaningless groups of clusters being selected.

Once the optimal cluster groups have been identified, the task of identifying the parameters of each cluster remain, as the programme does not make that explicit; nor does it indicate the particular variables which contribute most strongly to the defined group. The mean of each variable for each cluster is calculated, as is its level of standard deviation; therefore, the mean variable value showing distinct differentiation from those of the other groups, or the mean variable showing a very low level of standard deviation will be that which forms part of the type definition.

5.2.5 Parameters and variables

As discussed above, the use of TSC allows a mix of data types to be used in a single analysis, which ensures greater levels of nuance in the subsequent

clustering process than can be achieved with traditional methods. Unfortunately, initial analyses using the categorical variables 'form', 'context' and 'point morphology' were found to be uninformative for three reasons. Firstly, the high level of missing data, both physical and contextual, in this particular database ensured that the resulting clusters became dominated by 'unknowns', which warped the results. Secondly, it was found that some of the categorical information, principally the form of the spearheads, was essentially correlative with the continuous data - the latter combining to produce form and therefore not being an independent variable. Thirdly, where extrinsic variables have been used to create the clusters in the first place, the danger is that unless each resulting cluster were clearly and definitively unique in terms of their morphology, the clusters would have 'meaning' solely due to their selection criteria but nothing else. Consequently, although the capacity to use categorical data in the analysis was there, its use with this particular dataset would be counter-productive and only continuous, intrinsic variables were deemed appropriate for inclusion in the clustering process.

Once the analysis is restricted to intrinsic, continuous variables, the choice of which to use relate directly to specific research questions. In this case, there are four key areas of interest, two functional and two concerned with cultural practice. Did combat take place in a melee or in formation; were the spearheads used as slashing weapons, as well as for throwing and thrusting (which has a direct impact on the skill and training required); could the spear have been used by both specialist/elite warriors and non-specialist combatants, drawn from the majority of the population, as a primary weapon (see chapter 8 for a discussion of combatant identity); finally, is it possible for chronological or regional changes in emblemic style to be identified. Although some extrinsic variables and other sources such as iconography and historical records might be informative, the key intrinsic attributes here are size, morphology, decoration, length of spear shaft and edge damage. Unlike the LBA material, the preservation of the iron spearheads is such that only two examples each of edge damage or decoration can be identified, while a complete lack of extant spearshafts suggest the only method of estimating a general length is through iconography (which may not indicate norms for all areas or time periods). Unfortunately, the possibility of a normative practice of breaking

a spearshaft before deposition within a burial (as occurred at Gournay sur Aronde [Brunaux & Rapin, 1988: 93]) suggest that the use of grave or cist lengths to estimate maximum shaft length may be unreliable. Therefore, the variables selected to analyse the functionality of iron spearheads using TSC were the following (see Fig. 5), based on the hypothesis that an understanding of the variability in size and degree of robustness will illuminate the functional areas of interest, while any patterning in chronology, context or regionality identifiable in the resulting groups may provide information in respect of the latter two, cultural areas of interest:

1. Blade length
2. Socket length
3. Total length
4. Blade width at the widest point x blade length
5. Distance from the junction to the widest point x blade length
6. Distance from the widest point to the tip
7. Diameter of socket
8. Junction width

The variables of total length and the distance from the widest point to the tip were deemed directly correlative with other measurements, while blade width at the widest point and distance from the junction to the widest point were more useful when considered in conjunction with blade length, rather than on their own.

5.2.6 Results

The auto-clustering process produced the possibility of up to 15 clusters, with the AIC indicating that 4 clusters are the optimal number for this dataset (see Fig. 31 for examples of each cluster). One of the advantages here is that the problem of group outliers is ameliorated by allowing their inclusion in the most suitable group, but indicating both their presence and the degree of their departure from the majority by providing standard deviations for each group. Consequently, the definitions used here are more specific and widely applicable than the definitions used for the visual groups, which would more accurately be described as generalisations. However, the inclusion of outliers also reduces the visual similarity of group members, making the description of each group less reliable.

Group I: 34 members (41% of the classifiable population)

- Description: small sized spears with dumpy or narrow blades
- 'Definition': socket length is between 40mm and 60mm. Socket diameter is between 14mm and 16mm. Junction width is between 9mm and 11mm.
- Variation: shows low levels of standard deviation across all variables, particularly blade length and socket length
- 71% of Group I members were also members of Group 1 from visual analysis

Group II: 27 members (33% of the classifiable population)

- Description: medium sized spears with broad blades
- 'Definition': blade length is between 75mm and 95mm. The relationship of the width at widest point x blade length is between 0.370 and 0.460
- Variation: shows low levels of standard deviation across all variables, particularly blade length, socket length and socket diameter.
- Of Group II members, 26% were members of Group 1 from visual analysis, 26% were members of Group 2, 40% were members of Group 3 and 4% were members of Group 4

Group III: 13 members (16% of the classifiable population)

- Description: small blades with a very long and slender socket
- 'Definition': socket length is between 370mm and 550mm. Junction width is between 5mm and 9mm.
- Variation: shows relatively high level of variation on socket length and low level of variation on blade length
- Of Group III members, 100% were also members of Group 4 from visual analysis

Group IV: 8 members (10% of the classifiable population)

- Description: large sized spears with long blades and medium sockets
- 'Definition': blade length is between 100mm and 550mm. Junction width between 11mm and 16mm. The relationship of the width at widest point x blade

length is between 0.033 and 0.240

- Variation: shows high levels of standard deviation across all variables, but particularly with blade length, socket diameter, socket thickness and the ratio of distance from the junction to the widest point x blade length.
- Of Group IV members, 75% were also members of Group 5 from visual analysis, although it also contains objects 3 and 4 from the Miscellaneous Group

In some cases, an artefact could not immediately be placed in one cluster or another due to missing data, while the remaining dimensions or morphology can occasionally place it in more than one group. Where this is the case, it is up to the subjective judgement of the researcher to place the item; frequently a relatively simple choice, but occasionally complex. The subjective nature of placing material into groups was also noted by Cowen (1967) in relation to the bronze swords, and the concern is that such subjectivity might distort distribution patterns. Furthermore, in these cases the type definition is no longer wholly unique to the group, invalidating it to some extent; therefore does placing these items into the groups invalidate the typology itself? And if so, the question becomes: is it better to include as many objects in the typology as possible and partially invalidate the groupings, or to maintain the integrity of the groups by excluding cases, and in so doing accept a possibly substantially smaller dataset to work with? The conclusion drawn here is that the former is more appropriate than the latter, partly because in terms of the distribution distortion, the type definitions here are sufficiently specific, and the groups themselves not distinct enough in regional variation, for this effect to be too strong. More importantly, the preservation and original size of the dataset indicates an unacceptably high proportion of excluded cases (a total of 67) and a remaining number that is simply too small to analyse reasonably. Although circumstances dictate practicality over technical perfection in this case, it may not be the most appropriate course of action for other groups of material. Where the excluded cases form only a small part of the whole, and the type definition is very strong to start with, maintaining the integrity of the type definitions should be given priority.

The graphs below represent the regional, contextual, associative and chronological

patterns within the dataset when those objects with one or missing pieces of data are included in the groups. The same graphs, showing only the results from those with complete associated data and able to be classified in the initial clustering exercise, indicated simplified groups with less variation. Any analysis using only those cases initially placed into clusters will therefore be oversimplified and unreliable so all further discussion relates to the expanded groups.

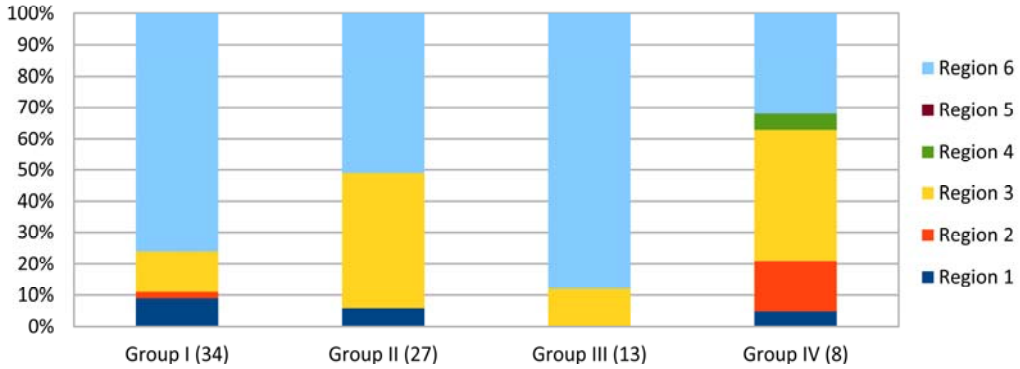

Illustration 22: Regional distribution of TSC groups

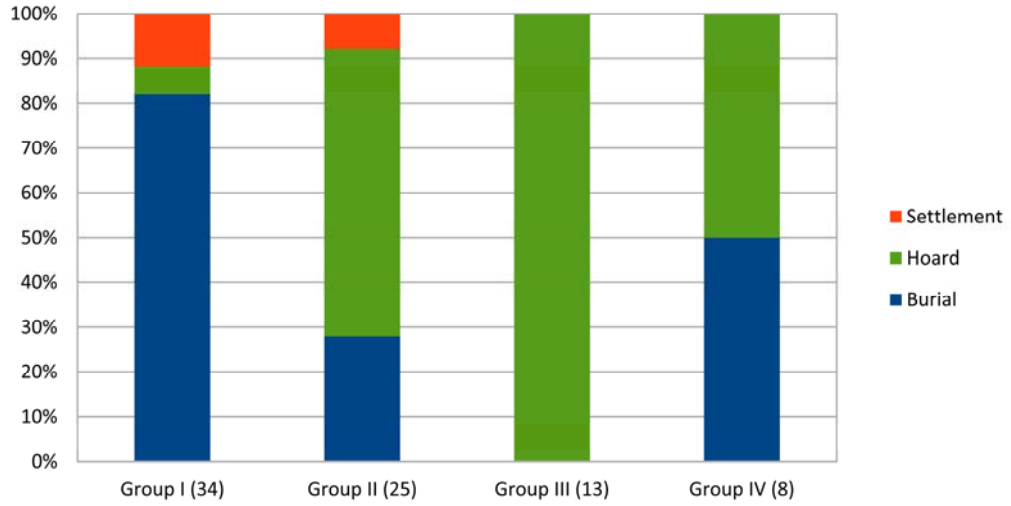

Illustration 23: Find contexts of TSC groups

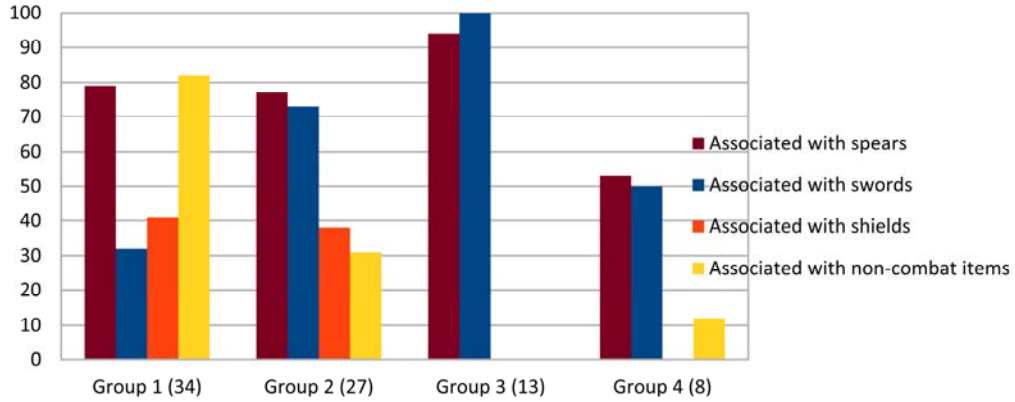

Illustration 24: Associations of TSC groups

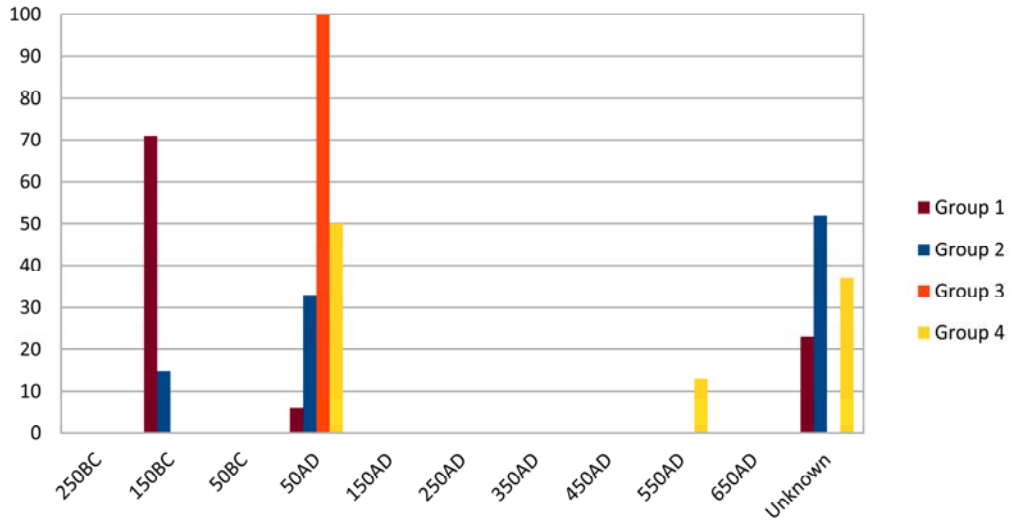

Illustration 25: Date ranges of TSC groups

The graphs here show some clear differences between the visual- and TSC-based clusterings, although general trends to seem to be mirrored (particularly in relation to the unchanging composition of Group III, which tends to skews the analysis). Again, we have certain regions exhibiting a wide range of different weapons (regions 6 and 3) and some not (regions 4 and 5), probably for the same reasons as noted in the previous discussion. Group IV is the most widely distributed, although numerically the smallest group, but Groups II and III further suggest a link between regions 3 and 6 as they are almost solely found in those areas.

The TSC groups appear to be more homogenous than the visual ones in terms of their contexts. All the groups are found in hoards, and (with the exception of

Group I) in relatively large proportions, which may well be partially due to preservational or recording bias, but suggests that spears generally, and not just one type, were considered of social and symbolic importance. Group III is the only form not found in burials at all, although this is probably because the entire group only originates from the South Cave find. It is not possible to assign any meaning to the context of this group until similar finds are discovered from other sites.

The proportions of associated material are very similar to that seen when analysing the visual groupings, except that Group I has a rather higher proportion of associations with non-combat items; therefore, the analysis made in section 6.2.2 regarding the significance of the associated material of the groups is also applicable here.

The system of presenting dates for the groups used in section 6.2.2 is also used here, and the rough chronology identified previously is still visible, although in a slightly clearer form. In general terms, Groups I and II are the earliest, followed by Group III, and that Group IV is the latest – although there is a degree of contemporaneity between all four. Groups I and II appear to be roughly contemporary, dated to between 200 BC and AD 100 (perhaps because Group II has a lower number of members of unknown date than Group 2). Group III, thanks to its single single depositional event, solely dates to the 1st century AD, while Group IV appear to be contemporary with Group III and are also found to date to the EHP. The later examples of Group IV are not particularly surprising; many of its members bear a resemblance to groups dated to the 6th and 7th centuries in Swanton's classification of Anglo-Saxon material, in addition to commonalities with the Kinclaven spearhead from Perthshire which initially formed part of this dataset, until radiocarbon dating of its shaft remains indicated it was roughly 10th or 11th century AD in date. It is interesting that all groups contain some examples dating to the 1st century AD, possibly suggesting that this period represents a peak in both the variability and deposition of weapons. Unfortunately, use of the same approach used in section 6.2.2 means that the problems with it detailed in that section are also applicable here; in addition, although Group II has more members with associated dates than Group 2, both Group II and Group IV still have a

relatively high number of members without dates. Were they known, those dates could either strengthen the patterning outlined above or considerably weaken it.

Several of the problems associated with the visual clustering technique have been at least partially resolved using TSC. The type definitions are now adequately specific, and the trends required to provide type meaning are here evidenced more strongly, although caution should still be applied when determining meaning from trends, rather than distinct divisions; however, the identification of even the roughest of chronological trends is a significant advance. The distorting effect of a group consisting solely of finds from one site has not been able to be ameliorated; should Group III be considered as part of the general progression of spearhead development in northern Britain, rather than as an anomaly, more finds of this type from a wider range of sites must be found. However, the clear problem with this typology rests not with the methodology but with the dataset itself; the TSC process cannot overcome the fact that interpretations must still be made based on a very small amount of data.

Of the two grouping systems presented here, although they are essentially correlative, quite clearly the TSC groupings supersede the visual groupings, for functionality and usefulness. The first analytical task the groupings can be used to accomplish is a discussion of the functional role of each type of spear.

Group I are somewhat problematic in determining function. Their contexts, size and associations suggest a probable domestic capacity as hunting spears – although this may have been a rarer, more elite pursuit during the IA and EHP than is usually thought (see section 7.2.1). Unfortunately for such an interpretation, some of the burials they are associated with are 'warrior graves', where the interred individual carried a sword and/or shield as well, suggesting a military application for the weapons. In terms of numbers, they have a high proportion of associations with spears, at least in part due to the instances of east Yorkshire burials where a number of spears were thrown into the grave, but relatively few with swords. Consequently, it may be that such small weapons were used in human conflicts, primarily as throwing spears in region 6, but that this practice was either not

widespread or did not form part of the warriors' self-identity – and more impressive weapons would normatively have been chosen for burial or hoard deposition; should they denote an involvement in conflict, it is in a functional, but not symbolic or status-loaded, sense.

Groups II and IV have contexts and associations which suggest a degree of combat functionality. Both are found in high numbers in hoards and burials, indicating a degree of symbolic value, and a high proportion are associated with weaponry; at least 50% of each group were found with other spears or swords. Group IV are large and sturdy enough to act as a primary weapon in their own right (see section 5.3). Too large for throwing, they would have made ideal slashing or thrusting weapons, either on foot or from the back of a horse or chariot. Group II is more problematic to discuss functionally, as it is the least extreme in morphological terms, and therefore potentially the most multi-functional. The members of this group could have been used as light throwing spears, slashing or thrusting spears, depending on their size and morphology. Although Group III were also found in a hoard and were all associated with other weapons, including swords, they are less likely to have been practically functional from a combat perspective than the other groups. The very small head, and long, streamlined profile, are reminiscent of the Roman pilum, while their date was a period in British history when there was a high degree of Roman military activity taking place (if further south than Yorkshire), and the pilum was likely to have been widely used during this time. Consequently, it is not unreasonable to suppose that this form was influenced by, or referenced, the pilum, but unlike the pilum many of the Group III spearheads have a rather rounded and dumpy blade in relation to their sockets. The pilum was effective because it could pierce its target, and subsequently impede and inhibit further activity. Group III spearheads are streamlined enough to have been aerodynamic, but their blades are not the most efficient shape to pierce and embed into anything. It seems most likely that these weapons fulfilled a symbolic or votive role, rather than acting as combat weapons.

5.2.7 Radiocarbon dating

One of the most intransigent problems of this dataset has always been the dates

associated with the objects. The problems of assigning dates through tangential evidence alone, the wide date ranges themselves and the clustering of dates around specific periods have all already been discussed. What needs to be made explicit is the very inhibitive effect this has on the possibility of reaching a working typology. Generally, the presence of regional or chronological patterning is held to validate the usefulness of a typology; without adequate dates for many of the objects, it is impossible to find reliable chronological patterns in either the visual or TSC-based groups. However, were such dates available from representatives of each cluster, and should those dates indicate chronological differences between groups, it would to some extent validate the methodology employed and the results achieved (for similar work in the LBA, see Needham et al, 1998).

Fortunately, a small minority of the spearheads have organic remains still attached, usually the wood from the shaft which lies inside the socket, which can be radiocarbon dated. Although it is possible that the spearhead and shaft were not the original pairing, such a date would at least provide a date for the final phase of use. With this in mind, funding was granted to cover the costs of obtaining a small number of radiocarbon dates. Of the four TSC-based groups, Group III, consisting entirely of South Cave material, is reliably dated to the mid to later 1st century AD (Powell, forthcoming: 2). For the remaining groups, funding restrictions required only the testing of Scottish examples, while the requirement for sufficient, unmineralised material, severely limited the number of examples that could be tested.

For Groups I and II, the only spearheads suitable for testing were those from Lochlee Crannog (ISP117) and the Empire Cinema at Dunbar (ISP91) respectively. Group IV contained two candidates from Camelon (ISP113 and ISP114) which could be tested. These two both contained significant amounts of shaft wood, identified using a reflective microscope as almost certainly ash (*Fraxinus Excelsior*), and definitely not oak or soft woods like yew or pine. Unfortunately, ISP114 proved to have insufficient CO2 to produce an AMS measurement, while ISP113 proved of too poor quality, so no date was obtainable for Group I. ISP91 was still involved in post-excavation work and was unavailable for testing during

the period when testing was being undertaken, and it was not possible to obtain permission to test ISP117.

Although ultimately unsuccessful in obtaining absolute dates for Groups I, II and IV, the purpose remains valid and of interest. Where funding is not restricted purely to Scottish examples (there are a number of artefacts from region 6 in each group which have attached organics), or when further examples with sufficient unmineralised material might be discovered, this approach to validating the TSC groupings could prove enlightening.

5.2.8 Typology and conflict identification

The most interesting implication for this topic of Wiessner's (1983: 271) work on material culture and style, noting that high levels of emblemic stylistic variation are to be found during periods of group stress, is that theoretically it might be possible to use typological development to identify periods of socio-economic stress, such as armed conflict. Groups I-IV were created using TSC to analyse functional attributes. Consequently, the groupings themselves indicate functional, rather than stylistic, variation and have been analysed as such. A typology based on stylistic attributes could test this theory but unfortunately the northern British iron spearheads are unsuitable as a dataset for this purpose.

As discussed at the start of the chapter, a number of attributes could be described as stylistic or functional, depending on the aim of the research. However, for the stylistic attributes to fulfil their role they must be visually arresting to some degree. Possibly the best method of conveying stylistic information involved emphasising and decorating the join of spear and shaft.The practices of attaching feathers, ribbons and leather cord decorations, or simply carving the wood of the shaft, are well-attested in the ethnographic literature on a range of cultures across the world (Wiessner, 1983: 265). It is entirely possible that this was the principal method of conveying emblemic or assertive style in British LBA, IA and EHP society, but the evidence is no longer extant. Similarly, aspects of emblematic style, such as decoration, are also absent as the preservation of the objects is too poor – such decoration can be seen on some of the southern British sword blades (Stead, 2006:

32) and Danish spearheads (Ilkjær , 2002: 44-47), however. The principal remaining attributes of this dataset that could convey stylistic information are mainly shoulder shape, method of shaft attachment (either riveted or folded) and the prominence of the midrib. However, these are too few, and too limited in their variability for a stylistic typology to be created.

Even where such a typology is possible, there are two other sources of information required to test the theory. Firstly, in order to track changes through time the dating associated with the objects must be accurate and apply to all constituents of the dataset. Without this, differences in stylistic attributes are merely variation, as opposed to change, and take place in a vacuum without reference to each other. Secondly, where a stylistic typology is presented with strong associative chronology, there would also ideally be a number of Wileman's (2009: 53-54) correlates of warfare present (such as burned sites or weapons damage), or historical records of the events taking place. Archaeologists are unable to easily discover the referent or symbolic message of stylistic content in the same way that the original audience or an anthropologist could. Therefore, without being able to match rapid stylistic change to known periods of conflict, any trends appearing in the typology could be linked to other issues. Interestingly, evidence of conflict is available here; the periodic Roman incursions into Scotland, principally around AD 83, AD 142 and AD 208, produced quite sufficient associated records. However, as previously discussed, the dating for these objects is so tenuous that its use here would probably be positively misleading.

5.3 Chapter discussion

Once we accept Groups I-IV as a working typology, we can return to the questions posed in section 6.3.4. The first question concerned whether fighting in the IA and EHP took place in formation, or whether the experience of combat was essentially a melee. There are a number of factors to consider here: formation fighting requires every individual in the front line to carry a shield, while the weapons involved generally tend to be sturdy and large. There are only 10 shields, or shield fittings, found in northern Britain that date to the IA or EHP. This is not incomparable with the LBA, but it is very probable that the majority of shields

during both periods were manufactured of organic material which did not survive (Marion Uckelmann, pers.comm.), and therefore general inferences made regarding shield use based on metal examples would be unreliable. Group I spearheads are clearly too small to be functional as front-line formation weapons, while even the slightly larger Group II are also unlikely to easily withstand or deliver the blunt force required in formation fighting. In contrast, Group IV are large and strong enough to withstand the forces involved; some of this group date to the EHP, from which comes a range of iconography indicating the use of shields and, indeed, formation fighting (Allen & Anderson, 1903). It therefore seems most probable that warfare during the IA consisted of a general melee, which developed into formation fighting during the EHP.

The second issue was the likelihood of IA and EHP spears being used as slashing weapons, in the same way they may have been in the LBA. In the absence of surviving evidence for edge damage, the main indicators here are length, breadth, morphology and weight of the weapon. The smaller the blade, the greater degree of accuracy must be employed to strike the target with a sharp edge. The blade itself must have sufficient breadth to withstand the force of any blows and a morphology that allows the weapon edge to slide along its target - angular blades will greatly limit the opportunity to inflict slicing damage. Finally, a spear which is too large or heavy will be unsuitable for slashing as it increases the strength required to recover from the movement, as well as unbalancing the weapon itself, unless a ferrule is used. Only Group II spears seem functionally capable of employment this way, while the size and weight of the majority of Group IV weapons suggest that spear slashing was not commonly employed in the EHP; without further evidence this is as much as can reasonably be inferred from the evidence.

The issue of slashing capability leads into another question - whether spears might have been employed as the primary weapon of the elite during the IA and EHP, as seems at least possible in the LBA (for a discussion of the status of combatants, the weapons available to them, and the role of warfare itself, see chapter 8). In periods or areas where spears are not used as slashing weapons, it is unlikely to

have been used as a primary elite weapon. The elites who, by definition, had access to the full weapons panoply are most likely to have chosen a weapon that was flexible in use, high status and involved skill to wield - combat being an opportunity to distinguish oneself. The morphology of IA spears does not indicate a range of functional applications or attempts to use these weapons as expressions of wealth. Finally, throwing or thrusting a spear does not provide the opportunity to display the sort of prowess required. The former puts the aggressor at a distance from their opponent and the latter involves only the most basic weapons skills. It seems likely that IA elites would have used spears, but as a secondary weapon to the sword. In contrast, some EH spearheads are capable of a slashing function (although some appear to large for this mode of use to have been practical), allowing a spearbearer to display skills in hand to hand combat, while their increased size and frequent visual similarity to sword blades suggest an emphasis on status. In addition, there is the iconographic evidence from EH carved stones, some of which show individuals on foot or horseback with a spear and shield but no sword (see chapter 6 and Anderson, 2005). The Aberlemno 2 features mounted warriors, who could reasonably be designated more elite than the footsoldiers, fighting with spears but not swords. Finally, the Dull slab shows a horseman, positioned above three figures on foot carrying shields, who carries a spear and shield but no sword. During the EHP it seems swords were not the automatic primary weapon under all circumstances, and spears had increased status and functionality for elite warriors. However, this remains a matter of functional application, and does not necessarily mean that spears overtook swords as symbols of warrior status.

The final question, whether chronological or regional changes in emblemic style could be identified, has proved more problematic. The aim here is to identify discrete cultural groups or periods of conflict. In this case, the dataset is too small, too poorly preserved and too undifferentiated to see such changes. It would be interesting, however, to apply the theory to another, more suitable, dataset to see whether it would be fruitful.

The concept of identifying periods of conflict through stylistic typologies,

although inappropriate for testing with the data available here, is one that could usefully be the subject of future research. The material chosen for testing would have to fulfil quite demanding criteria, as discussed in 5.3.7, but need not be archaeological in nature. Given that a theory, rather than material culture, is being investigated, although Roman or Ancient Greek material could be used, the data could also be far later in date or possibly even modern (depending on the society and location involved). Should such investigations have positive results, the concept could then be applied to archaeological populations which are well-preserved and have adequate chronological ordering.

As discussed above, it is obvious that the analysis in this chapter is based on a very small dataset indeed. Consequently, both this typology, and the interpretations based on it, should be approached as the imperfect first steps that they are. As the dataset grows, and as more methodological and theoretical frameworks become available to researchers, it is to be hoped that it may be improved and superseded

Chapter 6: Sources of Evidence for EHP Warfare

6.1 Introduction

6.1.1 Chronological and political parameters

The specific dates of the EHP, as it is envisioned here, are not necessarily widely accepted. The transition from one archaeological time period to the next usually coincides with a major change in material culture, political authority or, ideally, both. Consequently, these divisions act as both “academic convenience and...as indicators of the perceived significance of changes in the past” (Faulkner, 2004: 5) and are laden with theory. The EHP in northern Britain is quite problematic from this perspective, since there is no singular shift in material culture as there was between the LBA and EIA; what remains is a shift in political authority – the majority of evidence for which is textual. However, although there are identifiable shifts in polity during the early periods of the EHP, they take place gradually rather than as a result of a decisive break. Therefore, despite a level of artificiality, for convenience's sake the start of this period will be taken as AD 410, marking the end of Roman rule in Britain as a whole, and finish by AD 850, the terminus date used by Alcock (2003) in his seminal synthesis of the period. These dates roughly correspond to those used by other authors on the topic (Aitchison, 2003; Evans, 1997; Faulkner, 2004), and are intended to encompass the political development of northern Britain from a tribal society to geographically larger, established polities.

Textual evidence suggests that during the early centuries of the EHP, the tribal groupings of northern Britain began to coalesce into larger political groupings which are frequently described as 'kingdoms'. Since the geographic areas relating to these groups were rarely under the rule of one leader until the end of this period, it would be inaccurate to describe them indiscriminately as such, but certainly four

cultural groups have been identified within northern Britain at this time: the Picts, Scots, Britons and Angles (Fraser, 2009) (see Fig. 2). These divisions, although invisible in the minimal weapons record, do become visible and relevant when considering the iconographic evidence which forms a substantial portion of this chapter.

6.1.2 Sources of evidence

The preceding two chapters have exploited opportunities for study generated by aspects of the evidence in the research database: excellent levels of preservation associated with the bronzework provided the opportunity to experiment with the link between use and edge-damage, while a lack of previous focus on iron spearheads demanded efforts at classification. A third aspect of the evidence that requires attention is more properly an absence – the database indicates a significant lack of basic source evidence, in terms of swords, spears and shields, dating to this period. Only two swords are recognised as certainly EH in date, with a further two (both from Dunadd) without any assigned date but probably EH due to their find location. Using the dates provided in the database, 3 spearheads, and a possible further 5 (also from Dunadd), are EH in date. While only the roughest chronological ordering can be gathered from the typologies introduced in Chapter 5, they suggest that any EHP spearheads would be placed in Group IV, which has only 17 members. Whichever method is used to identify EHP spearheads, it seems clear that they number well under 20. Finally, there are no shields associated with the EHP at all, and consequently there is very little that can be analysed from the database in order to shed light on any conflict taking place during this period.

The absence of weaponry clearly does not indicate a lack of conflict, however; nowhere does the old adage 'absence of evidence is not evidence of absence' seem more appropriate. The written history of EHP northern Britain indicates an area in a constant state of flux, presenting relentless litanies of campaigns, battles, power struggles, killings and murders; the conflict that took place a frequently grim and functional activity with serious casualties, and bearing little resemblance to the highly ritualised, almost blood-less activity its earlier incarnations are occasionally portrayed as (Alcock, 2003; Fraser, 2009; see Chapter 8). Supporting the textual

preoccupation with matters military, an extraordinary collection of stone carvings from northern Britain repeatedly portray elite males as warriors, either through their accoutrements or actions. The iconographic representations of weapons on the sculptures are, in many cases, both clear and naturalistic – unlike iconographic representation from earlier periods – and consequently, this chapter stands as a case study in turning to an alternative source of evidence in order to ameliorate the weakness of the primary archaeological material. In addition to discussing the few EHP weapons in depth, the iconography will be analysed to seek information that might otherwise have been provided by a larger dataset – in particular, the size and morphology of weapons and the status of both warriors and warfare in the EHP.

6.2 Iconography

Iconography becomes a valued source of information during the EHP, in the form of secular images carved onto Class I, Class II and Class III 'Pictish' stones (although a few, like the Barochan stone, originate outside of Pictland). In addition to depicting symbols and religious imagery, the stones often present images of individuals carrying weapons and engaged in combat. There are 34 stones which display individuals carrying weapons (those only carrying a shield but no weapons were not included in that number), and which – since they do not seem to be engaged in hunting – are considered to be referencing warfare. These stones range from a single individual bearing a spear, to the explicit battle scenes depicted on the Aberlemno 2 stone and Sueno's Stone. The latter, often invoked as a key source of evidence for this topic due to its densely packed imagery of different forms of conflict, is considered to be 10th century in date (Aitchison, 2003: 46), and is therefore somewhat later than the period under discussion. However, due to its closeness (both chronologically and thematically) to the other sculptures discussed here, it has been included in some of the analysis; the stone is too weathered to enable consideration of the size and morphology of the weapons portrayed, but the imagery and themes depicted can be considered in relation to status and image (section 6.6).

Although the iconographic evidence can be extremely illuminating, it is not necessarily straightforward to analyse because its degree of realism must be

considered, as must its geographically limited origins. Monuments are value-loaded creations, deliberate and conscious representations of something else. What we see is what we are supposed to see, and not necessarily an accurate reflection of reality; not only do the Pictish stones depict only the elite's ideal of themselves, but we do not see the far larger proportion of society which had not the wealth and power to commission such monuments themselves. Therefore, the images on these stones represent only a certain type of combatant, a certain type of weapons and a certain type of combat or conflict. Furthermore, the evidence for those combatants, weapons and types of conflict originate only from Pictland (with the very occasional exception), which raises the possibility of an analysis that is based on very regionally-specific evidence being uncritically applied to a wider geographic area. Neither issue is entirely resolvable, although both can be somewhat ameliorated by considering the wider context: in regards to the former issue, all analysis should be informed by the creational bias within the imagery, while the imagery itself may be tested for reliability against the few examples of actual weaponry in the database. Finally, the latter issue may cause limited problems for this work, since although Alcock's synthesis (2003) identifies regional differences within EHP northern Britain, neither the minimal weaponry dating to the EHP, nor the greater volume of weapons from earlier periods, suggest significant morphological variation in weapons between the regions of northern Britain. However, presentation of status and image may vary, and it must therefore be made clear that any conclusions drawn on these topics using this data will only be applicable to one area of northern Britain.

Given that the Anglians began to mint their own coinage around the start of the 8th century (Fraser, 2009: 316), it could be argued that numismatics should contribute to an iconographic discussion. Unfortunately, those coins do not depict images of warriors or weapons and so are not relevant here.

6.3 EHP weapons and armour

6.3.1 Weapons in the database

Although there is very little material evidence of weapons dating to this period, there are three spearheads in the database that date securely to the EHP. Furthermore, although it is usually problematic to assign a date to an object based on its find location (not least because of long periods of occupation over several different periods is a feature of many sites in northern Britain [see section 8.4]), Dunadd's status as a high-profile, elite EHP site, and the association of its weapon finds with EHP material, suggest their inclusion here:

Spear No.	Find Location	Region	Form	Context	Associated Items
ISP6	Aldclune	2	Leaf	Settlement	Domestic
ISP85	Embleton	4	Unknown	Burial	Weapons
ISP33	Sancton	6	Kite	Burial	None
ISP134	Dunadd	1	Kite	Settlement	Weapons
ISP118	Dunadd	1	Kite	Settlement	Weapons
ISP121	Dunadd	1	Leaf	Settlement	Weapons
ISP135	Dunadd	1	Leaf	Settlement	Weapons
ISP136	Dunadd	1	Flame	Settlement	Weapons

Table 15: EHP spearheads of northern Britain

In addition, the 17 spearheads that form Group IV as identified in Chapter 5 are, admittedly tenuously, considered to be later than the other groups and so some of these may be EH in date.

Swords are similarly rare: two swords in the database are dated to the EHP, with a further two found at Dunadd:

Sword No.	Find Location	Region	Form	Context	Associated Items
ISW62	Carronbridge	3	Fragments	Settlement	Domestic
ISW83	Harviestoun House	2	Anglo-Saxon	Wet	None
ISW68	Dunadd	1	Fragments	Settlement	None
ISW88	Dunadd	1	Fragments	Settlement	None

Table 16: EHP swords of northern Britain

Although the situation is not perhaps so dire that we can say "there is no archaeological evidence as to the distribution and characteristics of swords" (Evans, 1997:39), it is certainly instructive that Aitchison (2003:45) describes the seven combined finds of weapons from Dunadd – supposedly a royal and military stronghold – as "extraordinarily productive".

Here we can draw on alternative sources of evidence to identify what the original proportions of the material accoutrements of warfare might have been, had depositional, preservational and excavation factors been otherwise. Looking at the burial record across Britain as a whole during this period, Härke (1990: 26) found that spears were very common in graves, shields were found in around half of all the burials, and swords were found in roughly 10% of all burials. The argument for a low proportion of swords, in relation to spearheads, is supported by Evan's (1997: 39) conclusion that the graves and weapon deposits from EHP Britain and Sweden indicate that only 10%-30% of warriors would have carried swords.

The evidence becomes more complex when textual and iconographic evidence is considered. The percentage of textual mentions of specific weapons in *Y Gododdin* (Clancy, 2011), and iconographic representations of the same, taken from the total of all mentions and depictions of weapons, is as follows:

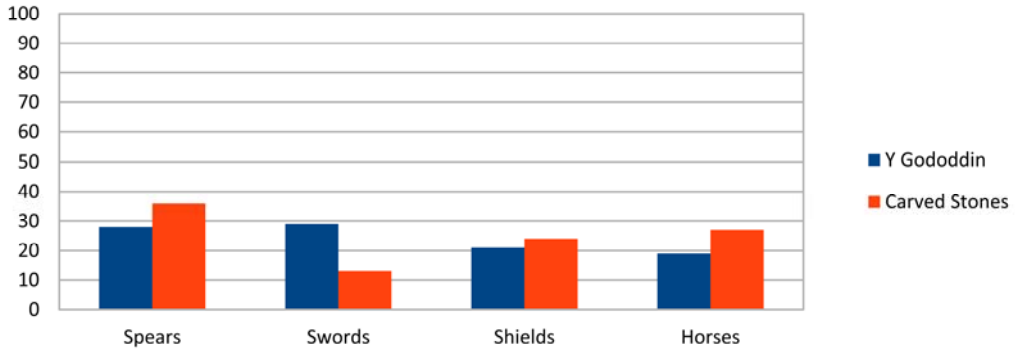

Illustration 26: Comparison of weapon proportions from Y Gododdin and Pictish stones

The representations on the stones appear to support the widespread practical use of spears as a primary weapon, with swords reserved for a minority, whereas spears feature prominently in the text but are not the most commonly mentioned. Both sources indicate the use of horses and shields, suggesting that their involvement in warfare is not as rare as we might believe if looking solely at archaeological

evidence. Interestingly, 8 of the 11 horses mentioned in the text are specified as stallions. No mention is made of mares or geldings, thus reinforcing the androcentric nature of warfare during the EHP.

Given that both the textual and iconographic evidence is associated with the elite proportion of EH society, and that both sources are deliberate attempts to present that group in a particular way, one might expect the presentation of weapons use to roughly correlate. However, there are two explanations for this disparity in the data. Firstly, while in practice the spear might have been a very common weapon, it was the sword that held iconic status and was the weapon most culturally associated with successful warriors (see Chapter 7). This would explain a high proportion of spears in the burial evidence from the general population, while finding a high proportion of swords in a text intended to glorify a very small group of elite people who were the most likely to bear swords. Although the stones may well have been erected for the same purpose, their message was quite probably public and immediate to the contemporaries of the individual or individuals referenced. Cultural practice may have prevented individuals from being presented in an inaccurate way – for example, sanctions might have been taken against a man who was depicted with weapons to which the surrounding community knew he was not entitled. Secondly, the iconic nature of the swords may have led to swords and spears being viewed differently; spears might have been considered a personal weapon, eligible to be buried with an individual on their death, whereas swords might have become high-status heirlooms, possibly even endowed with their own names and identities (Pearce, 2009), and were passed down through generations. Even should they break, the components might be recycled in order to retain the essence of the original. Such practices would result in few swords in circulation during the EHP, which would be reflected in the iconography, lead to far fewer swords than spears found with burials, but would ensure that swords left a relatively large imprint on cultural consciousness, partly expressed in heroic praise poetry.

6.3.2 Weapons represented iconographically

One of the problems in using the images on Pictish stones to make determinations

about material culture is that there is no way to adequately quantify the realism of the depictions; however, Hughson (1992: 57-8) makes an argument that the variation shown in equine conformation suggests a high level of specificity in terms of what the stonemason saw. For example, if the depiction of the horse is so detailed that it is possible to identify the breed as Bactrian or Andalusian, then details on the rest of the stone are likely to be as accurate. Taking this further, Hughson attempted to determine the size of horses (a critical issue in the discussion on whether cavalry could have formed part of the fighting forces of this period) by comparing their height on the stones to those of their riders. Although not precise as to the methodology used, Hughson concluded that EHP horses ranged in height from 12.2 hands to 15 hands, and that certain breeds were bred for specific tasks (riding or pulling carts, for example) (ibid: 57).

One of the key problems with a lack of physical evidence of weapons is that the range of their size and morphology is unknown – unless the same concept trialled above is applied to weapons as well as horses. Taking an average male height of 175cm (Rees, 2002: 340), measurements were taken of the size of the spearheads, spearshafts (which will be particularly valuable, since there is no physical or textual evidence regarding these from this period), swords and shields on the 21 stones which depict individuals with one or more weapons and do not reference hunting. Because the crucial measurement is that of the human, it was not possible to include a further 9 stones in which the human figure was so weathered or damaged that taking such measurements was impossible. Since very few figures are depicted as standing up straight, and most are seated on a horse, the figures were measured from the heel, to the back of the knee, to the posterior and up to the crown of the head. It was frequently impossible to distinguish spearblade from spearsocket, so spears were simply divided into spearheads and spearshafts. The area of the shields were calculated, in order that circular shields (13 examples) and rectangular shields (3 examples) might be made comparable. A further two shields were depicted from the side, so that only their height could be determined; these were 58cm and 54cm high, falling roughly in the mid-range of shield diameters, which indicates they were not of an unusual size.

Weapon	Total Number	Smallest (mm)	Largest (mm)	Mean (mm)
Spearhead	20	134	514	287
Spearshaft	19	1155	2082	1574
Sword hilt	4	169	240	190
Sword blade	4	362	675	514
Sword total	5	531	844	702
Shield (area)	16	456cm²	4,681cm²	1,597cm²

Table 17: Weapon sizes determined by iconographic analysis

The only way to determine whether this is a reasonable approach to identifying size ranges is to compare this data with corresponding measurements in the database, where possible. Although there are no surviving EH spearshafts, we can compare spearheads. The iconographic blade length does correspond with the total length of the Group IV spearheads (100mm-550mm) identified in chapter 5, and which are tentatively dated to LIA and EHP, and the mean length of 287mm compares relatively favourably with a mean length of 210mm for iron spearheads in the database generally. Of the five probable EHP spearheads in the database, only 3 have sufficient preservation to obtain length measurements, which are 97mm, 98mm and 151mm. They are thus some of the smallest in the entire database, and smaller than both the Group IV spearheads and the iconographic stone versions. In terms of morphology, Laing & Laing (1984: 281) have previously described the stone versions as long-shafted and leaf-shaped, which they say matches the excavated evidence. In fact, the iconographic spears are not so homogenous; certainly the long shafts show little variation, but there is variation in the form of the spearhead (as there is in the archaeological record). Of the iconographic spears, 70% are angular (44% diamond, 26% kite) and 30% are sinuous (all leaf shaped), which is almost the exact opposite of the proportions of all the iron spearheads in the database (33% of which are angular and 67% of which are sinuous). Since the Group IV spearheads do not indicate a pattern of angularity, this is probably less to do with variations in form over time and more likely to be because angular spears are either associated with high status, with warfare, or both.

Of the four EHP swords in the database, the preservation is so poor that only one hilt length (97mm) and one blade length (750mm) could be obtained between them; unfortunately, the former is considerably smaller and the latter considerably larger than the measurements obtained from iconographic representations. However, the mean iconographic blade length, at 514mm, does correspond more closely to the mean blade length of iron swords generally, which is 533mm, while the mean iconographic hilt length (190mm) is slightly smaller than the mean hilt length of iron swords generally (125mm). Despite similarity between iconographic and IA sword measurements, the discrepancy between iconographic and EHP sword measurements (although only based on one set of measurements) might indicate an unreliability in iconographic measurements were it not for another aspect of the excavated material which is certainly mirrored on the stones. The type of expanded crescentic scabbard chapes shown on the Benvie stone have been found in excavations at St Ninian's Isle, while the contoured scabbard chapes of the type shown on the Inchbrayock stone are found all over Anglo-Saxon England, at Selmeston and Brighthampton for example (Laing & Laing, 1984: 281-282).

Given the complete lack of shield finds from this period, there is nothing with which to compare the measurements shown above, although taken at face value they suggest generally quite small shields, the majority of which were round (although square and rectangular examples were depicted on stones at Shandwick in the Highlands and Newton of Collessie in Fife, in addition to the famous examples from Birsay, although these last are outwith the area under discussion). None of the examined stones depicted H-shaped shields. The majority feature a central umbo (although it is quite possible that all shields originally had this feature but that weathering has rendered it invisible), and are worn either slung round the neck with a cord or carried on the arm.

Attempting to determine normative aspects of EH weapons from their depictions on Pictish stones is a method which has provided mixed results. The theory that the stones can be used as realistic representations of EH material culture is valid, in that the morphological presentation is extremely valuable, requiring little

specificity to be useful and supported by archaeological evidence. However, it is less useful when attempting to determine normative size ranges of weapons, since the combined effects of the unknown ability or desire of a craftsman to truly reflect scale, and weathering on the stone itself over more than a millennia, renders specific measurements imprecise.

6.3.3 Armour

Physical instances of armour, in the form of helmets, chainmail, breastplates, gauntlets and leg greaves, are all conspicuously absent from the EHP archaeological record. Despite the existence of considerably complex armour in other areas of the world, such as the Dendra suit of armour from Greece and dating from 1550-1500BC (Snodgrass, 1964: 71-73, 76), physical evidence for armour in northern Britain would be non-existent in the LBA and the IA were it not for two pieces of ferrous mail found at separate sites in Yorkshire, and one at Carlingwark Loch, dating to the IA. The paucity of such items continues into the EHP, since the only armour discovered in EH northern Britain is a helmet, found at Coppergate, in York. However, the textual and iconographic sources would indicate that this lack is unusual since armour features clearly in both. In addition to the 7 mentions of armour in *Y Gododdin* (Clancy, 2011), Breeze (2001: 152) notes that a 7th century poem concerned with the activities of Cadwallon describes Welsh infantry as "lacking a bright, blood-stained corselet" which might indicate that some form of body armour was likely to have been worn by the majority of the combatants, even the lower ranks of fighters, except in rather unusual circumstances. Additionally, a number of the Pictish stones, such as Aberlemno 2, depict warriors wearing long tunics with a split from knee to hip, which appears to differ from the short tunic usually worn and suggests leather armour or chain mail (Laing & Laing, 1984: 278). Such depictions of armour are unlikely to be fanciful additions by the stonemason, since one of the types of helmet represented on Aberlemno 2 bears a strong resemblance to the Coppergate helmet, leading to interpretations of the stone as a representation of a battle between the Angles (origin of the helmet style) and the Picts (origin of the stone) (Hooper, 1993: 191).

Despite sources suggesting that armour was a normative accoutrement for combat,

there remains the stubborn lack of physical evidence. In addition, Roberts & Cox (2003) note that the majority of the conflict injuries they identified were cranial, which would suggest a significant proportion of combatants did not wear helmets – although that does not mean that other forms of armour, such as breastplates, were not worn. It is possible that a proportion of combatants routinely wore armour made of boiled leather, which would be effective but unlikely to survive as part of the record and so become invisible, except in texts. A very small minority might have been able to afford metal armour, but given their small numbers combined with the already minimal amounts of metalwork surviving from this period, it is not surprising that it does not appear in the record. Further, the assumption is that the Coppergate helmet represents the apex of desirability in terms of armour; it is quite possible that metal pieces were less functional than their leather counterparts (see Chapter 4 for a discussion of the merits of metal and leather shields) and thus their expense and rarity would have made them status items, for display and parade only.

6.4 Status and image

While texts are deeply informative about EHP leadership, the iconography of the Pictish stones provides a valuable source of information on the link between warfare, status and image. This is often overlooked in favour of approaches which theorise about the meaning of their symbols, their function or art historical value. There are 74 Class II and Class III stones with secular images, 24 of which are either fragments or feature unarmed individuals and are therefore not relevant to this study. The remaining 50 stones can be divided into four groups:

1) Hunting scenes, featuring individuals on foot or horseback, with a combination of hounds and wild animals, usually deer (34%)

2) Warfare scenes, featuring armed men, on horseback or foot, carrying a range of offensive or defensive weapons, and always demonstrating some level of hierarchy between the figures, through their relative sizing, positioning or range of equipment carried (those stones where the only weapon is a spear will not be included in this category, as spears were a principal hunting weapon) (20%)

3) Complex scenes, featuring multiple categories of activity, with the arrangement providing no narrative clues as to the events depicted (18%)

4) Armed men, displayed without context (28%)

These categories are not wholly unproblematic; for example category 4 includes a large number of stones featuring single horsemen carrying a spear, which cannot be included in categories 1 and 2 since there are no animals or hierarchical groups present, but which nevertheless may have been associated with either. Consequently, it is most productive to consider each stone holistically, examining all the carvings on one stone, as well as to compare such stones with each other. In this way it may be possible to identify the relationship between different aspects of the lives of the EH elites.

The positioning of the images on the stones can be quite revealing about the relative status of the activities presented. In all but two cases, the religious imagery was dominant (in that it covers more than 80% of at least one side of the monument), reflecting the stone's essentially religious nature, while around 80% separate the secular and religious aspects of carving onto different sides of the stones, which suggests linked but essentially separate spheres of conception. It is possible, however, that a strict secular/religious divide is not necessarily accurate; for example, a hunting scene may appear conceptually straightforward to a modern observer but have contained religious overtones to those that made and saw the monument in the EHP. Where the 'front' is considered to be the location of the religious imagery, the type of image with dominance on the reverse will be of interest. Anthropomorphic figures are dominant on only around 50%; where the human element is not the main image, it is frequently pairs of symbols, such as the double-disk and Z-rod, which dominate. However, where the secular images are warfare scenes, that dominance rises to 100%. This supports the significant cultural importance attached to warfare indicated in EHP texts, albeit on a minority of stones.

A number of the Pictish stones might be classified as 'trans-themed' – that is, the images on one stone reference religion, hunting and warfare at once. For example, while the vast majority of the stones bear religious imagery on at least one side, the hunting scenes found on the Tullibole, Meigle 11 and Mugdrum stones may

also reference warfare given that the size and positioning of the hunters suggest hierarchy – a key feature of the warfare scenes. Additionally, the warfare scenes on the Barochan, Dull and Dupplin stones contain a dog, while the Menmuir 1 stone shows what appears to be a beast, possibly a deer. Dogs and beasts are key features of hunting scenes, although in the case of the Barochan, Dull and Dupplin stones, these may not be true trans-themed stones since the possibility has been raised that dogs were employed as weapons during fighting in the IA, and may have continued to be so during the EHP (Barnetson, 1982: 104-5; Sealey, 2007: 37). The numbers of trans-themed stones could be significantly boosted further if the category definitions for hunting and warfare were somewhat relaxed, since the division can at times prove artificial – for instance, some stones purport to show hunting scenes but the 'hunters' carry more of the warrior's weapons panoply than just a spear. It is not unreasonable to speculate that hunting may have been an activity used to train warriors, given the degree of similarity of skills required for hunting and warfare. Further, the category of armed men, shown with simply a spear, may be deliberately ambiguous in order to reference warfare and hunting at the same time, intended to depict the figure as a generally skilled, talented and elite individual. In this context, division between hunting and warfare would be pointless. Although there are monuments clearly dominated by their reference to warfare, such as Aberlemno 2, or to hunting, such as the Hilton of Cadboll stone, drawing an automatic distinction between the two categories will not always be appropriate.

6.5 Chapter discussion

The first issue to consider for this chapter is how effective an approach using an alternative source of evidence is, when archaeological evidence is absent, and in some ways, it has been relatively productive. Although clearly not suitable for detailed analysis, using iconography to identify rough sizing and morphology of weapons does appear accurate to an extent: measurements and shapes of the bladed weapons drawn from the carvings correspond approximately to the size and shape of IA weapons, and although comparison to extant EHP weapons shows some degree of disparity, the small number of comparable measurements prohibit too firm an analytical reliance on the difference. Furthermore, spears appear to be

the most common and primary functional weapon during the EHP (although the sword maintained its iconic status), and angular spears may have equated to weapons of status, warfare or both (which might therefore indicate that sinuous spears were hunting weapons). The shields in use were generally round and varied considerably in size, from small fist-shields to larger examples which could be employed during fighting in a unit. Armour is also likely to have been used, but would more commonly be made of boiled leather than of metal. Examining the placement, positioning and thematic trends of secular images on the stones indicates both that there may have been a considerable practical and symbolic overlap between the activities of hunting and combat in the EHP, and that involvement in both were key aspects of the identity of elite males.

Unfortunately, there are some areas where the approach used here has been less successful. Too often it is not possible to distinguish any commonality or differences between the cultural groups known to have been present in northern Britain. Evidence that strictly only applies to one area must either be extrapolated out to the others, on the grounds that there is no evidence at all regarding that particular issue from that area, or whole areas must be considered an unknown quantity. For example, in the absence of supporting physical evidence, do we suggest that angular spears are associated with warfare in northern Britain, or just in Pictland? If we taken the latter approach, we may be left with considerably unbalanced information – about the Strathclyde Britons we would know almost nothing. With evidential sources so sparse, it perhaps makes more sense, where an appropriate argument can be made, to allow extrapolation between areas. Certainly it is unlikely that the groups within northern Britain were particularly different in their approach to warfare, since Carman (1999: 49) notes that it is difficult to fight a pitched battle between two culturally very different sides because differences in weapons, strategy and tactics will inevitably lead to military advantage for one side. Such continued weakness is most likely to result in the weaker group being unable to maintain their independence, whereupon they will be assimilated into the stronger group.

Finally, the original premise of this chapter, that there is too little EHP metalwork

to carry out an adequate analysis of EHP warfare, might profitably be challenged. Because so little work has been done on either attempting to identify diagnostic EH weapons, or examining iron spears in general, it is possible that at least a proportion of the existing ferrous weaponry currently identified as IA could instead be EHP. It is to be hoped that some of the findings of this thesis will facilitate a re-examination of 'IA' weapons, and should this be the case, then the topic addressed here can be returned to with further evidence.

Chapter 7: Life Cycles of Northern British Weaponry

7.1 Introduction

Where catalogues of archaeological material discuss a series of objects, the emphasis is often squarely on their chronology, while the importance of the individual pieces can be sidelined. This chapter aims to examine the individual weapons in the attached database, in relation to each other and occasionally external sources of evidence (be it textual, iconographic or osteological), to gain an understanding of their life-cycles (York, 2002) . Within the foci of 'birth', 'life' and 'death' lies a wealth of information on issues as diverse as the status of individuals and weapons, the disjunction between socio-cultural ideals and reality and the cyclical nature of social organisation and hierarchy. These topics are not static, but change through time and space; therefore, an analysis of the life cycles of northern British weaponry aims to identify regional and chronological developments in the physical practice and social role of conflict, war and warriors in northern Britain over the course of fifteen hundred years, from 1250BC to AD 300. Ideally, EHP material would also be included in such an analysis, but it became increasingly clear that evidence from this period was almost entirely absent from the record (for reasons which will be discussed in the following chapter), and so this chapter is solely concerned with the LBA and IA.

This analysis is based on the information held in the database on the sequence of weapons produced in northern Britain, which is similar to that gathered by York (2002) in her examination of the life cycles of BA metalwork deposited in the river Thames. Both databases collected data on findspots, dates, typological placing, decoration, the presence of organics, method of attaching organic material, use-wear and purposeful damage – where possible. Unfortunately, even the most exhaustive data collection will be unable to overcome weaknesses with the available evidence. The numbers of both bronze and iron artefacts in the database for this study are comparatively small when compared to continental, or even

southern British, find densities. Furthermore, much of the extrinsic (and even intrinsic, where preservation is poor) information is missing, and accurate dating is minimal, resulting in difficulties in pinpointing the regional complexities within northern Britain over time. It is also clear that the artefactual record currently available is in no way complete, since a number of individual finds over recent years have forced reconsideration of particular aspects of material culture. James (2007: 163) notes that the find of IA ringmail from east Yorkshire, where such armour was previously absent from the record, and a form of terret mould from Grimsby of which there are no actual examples, demonstrate the point. The cache of IA weapons from South Cave in Yorkshire is also evidence of our evolving understanding of material culture, introducing at least two forms of spearhead that were previously entirely unknown in Britain.

In order to illuminate the topics outlined above, the database was interrogated for patterns in contexts, associations, damage, decoration, elaboration, size and morphology. In the process, some wider issues/fields of direct relevance to much of this chapter were introduced; particularly hoarding theory, osteoarchaeology, textual analysis, social hierarchy theory and metal sourcing and metallurgy. Far more could be said on each (although osteoarchaeology and textual analysis are dealt with further in Chapter 8), but in the necessary interests of brevity only the most superficial approach has been attempted here.

The normative structure for a chapter focusing on the topics outlined above would be to start with 'birth', before moving through 'life' and eventually discussing 'death'. However, archaeologists begin their examination of the archaeological record with 'death' – analysis of depositional circumstance is crucial to a subsequent understanding of the life and manufacture of an object. Consequently, this chapter will reverse the usual structure, working backwards from 'death' to 'birth'.

7.2 “Death”

At the final stage in the life-cycles of weapons, there are a number of issues to consider other than just the patterns visible in the context and associations of the

items in the database. The 'killing' of some of the weapons connects with a body of theory on social substitution, markers of social status are visible, and the rate of deposition itself is demonstrative of cultural cycles of activity, in which methods of presenting identity and status fluctuate.

7.2.1 Contexts and associations

For a depositional context to be meaningful, it must have been a deliberate choice. It is possible that a proportion of weapons made their way into the archaeological record through accidental loss or other involuntary factors, but these are likely to be very small. The size of the weapons means it would be hard to simply 'lose' one, and should one become lost their physical and symbolic value is such that great lengths are likely to have been gone to in order to retrieve them. Furthermore, York (2002: 89) noted that the patterning evident in southern British LBA hoards recovered from rivers was such that practical, economic and social factors were clearly a factor, rather than random losses. Given the limited number of weapons likely to be affected, and the problem of how to identify these few from the rest of the population, the following analysis treats all contexts of the weapons in the database as deliberate.

A number of theoretical frameworks have been established in order analyse individual finds and, in particular, hoards. Many of the earlier methods relied on descriptive terms to categorise and analyse material; these included single or multiple finds, 'wet' and 'dry' locations, and those from burials, settlements or stray finds (Bradley, 1990: 5-10). However, a number of problems with this approach became apparent. Firstly, dividing the material in this way involved too much conjecture and was too simplistic: 'multiple' finds might not have been deposited at the same time and single finds might be the only surviving remains of larger caches, while the categories of 'wet' and 'dry' are not detailed enough – for example, 'wet' locations can mean rivers, lakes or bogs (ibid: 5-9). Secondly, the descriptive approach did not link the *content* and *context* of hoards in such a way as to make meaningful categories. An influential publication by Levy (1982) addressed this latter issue, by developing a system which divided material into two groups – those with a ritualistic, and those with a non-ritualistic, focus; the former

were said to be found with a restricted range of associations, contain valuable, high status goods, and be placed away from settlements in special locations. Certainly, the latter point is one emphasised by a range of authors (Osgood, 1998: 86; Pryor, 2003: 287; Hunter, forthcoming) who note a deliberate choice of symbolic location for deposition, including rivers which might have been trade routes, mountain route-ways, the edges of cultivated land and liminal areas relating to boundaries. These also correspond to Bradley's (1997: 69) work demonstrating finds in locations that correspond to the territorial boundaries of suspected polities in the LIA. The non-ritualistic group were characterised by dry, shallow depositions and a content that was dominated by small tools and personal possessions, often in quite poor condition. If the Levy model is used as a framework to analyse the dataset under discussion, then the latter group, the depositional motives for which Bradley (1990: 194) lists as including storage for economic purposes, concealment or accidental loss, will be of little interest here for a number of reasons. Firstly, accidental loss has been dismissed above as unlikely to occur to a particular extent within this dataset. Secondly, although economic storage or concealment could have occurred to such an extent that it formed its own trend during a particular period, such motivations are more likely to be the result of a particular incident or circumstance, the understanding of which would rely heavily on pseudo-history or speculation. Such events are of interest to historians, but an archaeological study must retain a focus on grasping long-term cultural patterning. Thirdly, the specified content of the two groups suggest that a dataset concerned solely with weapons will automatically place all its members in the ritualistic group.

However, there remain a number of further analytical problems with the Levy model. The first is the issue of applicability over time and space; Bradley (1990: 10), noting that Levy's study was based on Danish BA deposits, questioned its applicability to other areas of Europe or Britain on the grounds of “cross-cultural generalisation” - Hunter (1997: 120) notes that there can be considerable variation in IA hoarding practice, even between regions within northern Britain. Furthermore, both Levy's work, and many other publications on hoards, are focused on the BA, and IA hoarding is under-researched – it is debatable the

extent to which one might apply a theory developed in response to BA hoarding to IA hoarding. Certainly the practice of depositing intact weapons in earthworks during the IA, when the symbolism of settlement boundaries was significant (see section 8.4), suggests that the location of ritualistic hoards away from settlements is less applicable in the later period. Additionally, although content is clearly a key factor in determining hoard type using the Levy model, some depositional material might contest this interpretation. Although not weapons themselves, the find contexts of chalk figurine representations of warriors from Yorkshire suggest that the nature of an object did not necessarily dictate the circumstances of their deposition; these were found in a variety of contexts, ranging from the domestic (with pottery in ditches, postholes and beneath floors) to the ritualistic (in association with a miniature shield and water source) (Stead, 1988: 23). Finally, even if one were to accept all weapon hoards as ritualistic, within that classification are a multiplicity of possible motivations which the model does not begin to address; there is no system to address whether weapon deposits might have been votive offerings, offerings to the dead as part of burial rituals, expressions of competitive consumption, territoriality, ownership or control, or triumphal display (York, 2002: 90). Whether they were deposited by their owners, or taken from another group, is also an issue for consideration.

This work is not the place to create an alternative model of analysis which addresses the problems outlined above. However, the particular theoretical position that underpins much of the discussions of context and association below should be made explicit. Although there was certainly considerable change in hoarding practice between the LBA and the IA, a commonality is that depositional practice almost certainly fulfilled several functions at once, and that some degree of ritualised action formed an element of the motivational impetus in all of the hoards (and the majority of single finds). Therefore, an interest in the extent to which the context and associations can imply a greater or lesser ritualistic element is present. It is also to be hoped that other identifiable trends within the dataset will shed further light on the meaning and type of depositions seen in northern Britain in the LBA and IA.

The following chart indicates the proportions of weapons in the dataset which are found in the contexts discussed in section 2.4.6:

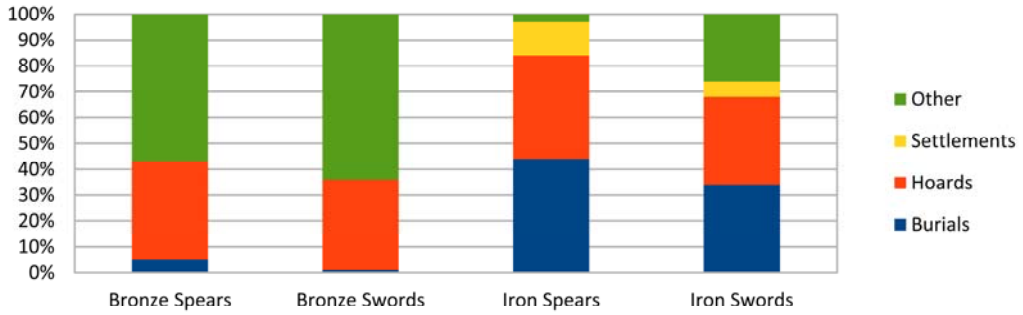

Illustration 27: Contexts of the weapons of northern Britain

Clearly, key contextual detail of many of the LBA weapons and IA swords is missing, but where it is present, some trends can be seen. Most obviously, the graph suggests that weapons do not appear to have been considered particularly suitable for deposition within settlement or domestic contexts during either period, which may reflect the sense of the warrior as 'other', discussed in section 8.1.2. This holds true in the LBA, but fails to take into account nuance and overlap within the categories during the IA; some hoards, such as that from Traprain, were found within a settlement but were classified as a hoard based on associations. Further, some of the more ritualised deposits are classified as settlements, such as the intact sword recovered from the rampart at Birrenswark. Deposition on settlements does not appear to have occurred to any meaningful extent during the LBA, but during the IA it does occur, sometimes in a very ritualised manner. With the exceptions of ISW53 and ISP124, recorded as recovered from a 'defensive ditch' and rampart respectively, it is unfortunate that there is insufficient contextual information to determine the extent to which weapons from settlements were deposited in boundaries and gateways, the practical and symbolic importance of which are discussed in section 8.4.

During the LBA burials with weapons are extremely rare; although their inclusion in hoards, and the fact that they are frequently found in remarkable positions or locations, may suggest that during this period the weapons have a strong votive and ritualistic association. In contrast, the number of weapon found in burials during the IA is far higher, which could be read as an indication that weapons

became more inextricably related to individual owners during the IA than the LBA. However, not only is it possible that single weapon finds in the LBA are the equivalent of weapon burials for a fugitive burial rite, thus linking weapons to individuals in the earlier period, but further interrogation of the database indicates that the high proportion of weapons burials indicated above was not normative practice. All but 2 of the swords and 7 of the spears found in burials originated from Region 6, and even in that region, warrior burials were a minority rite.

The phrase 'warrior burial' or 'warrior grave' has fluctuated in its use; traditionally used to refer to the burial of an individual with weapons, Härke's (1990) influential paper fluently and cogently presented the argument against automatically assuming that the individuals buried with weapons had been warriors during their lifetime. Consequently, the term 'warrior burial' went out of fashion, but it is used again here after Hunter (2005: 50) persuasively made the point that although these individuals may not have carried weapons in life, they were deliberately sent to the grave with that persona. Given the importance of ritualised identity creation identified in this thesis, it therefore seems appropriate to use the term 'warrior burials', albeit with the provisos made by Härke in mind. Such burials, while remaining a minority rite in relation to other forms of burial, are widespread, although rates vary considerably on a regional basis. 50% of the total are found in east Yorkshire, 3 are found around the Firth of Forth and there are a few with uncertain dates in regions 4 and 5; considerably more than these are found in southern Britain (Hunter, 2005: 50). Even within the large cemeteries of east Yorkshire, the proportion tends to vary, with 3% found at Burton Fleming, as compared to 15% at Rudston (Hunter, 2005: 50). When this variability in density is considered in tandem with the general rarity of swords found in burials, and the existence of equivalent graves whose only difference is the absence of a sword, it suggests the criteria for being buried as a warrior are, as Härke (1990) argues, certainly more than simply possessing one. Such evidence suggests some 'real' warriors are buried without weapons and some non-combatants were buried with them; the cause may lie in the disjunction between reality and identity suggested earlier. It appears to have been possible to have inhabited a role whose persona you did not identify with, and vice versa; therefore the warrior burials are those of

the individuals who most *identified* as warriors, or whose families did. Choice appears to have been more important than reality. The focus of such identification is clearly the swords – at least in part because, despite a far smaller general population, there are proportionally more swords than spears found in graves: a total of 19 IA graves contain a sword, while only 16 contain spears. This may be a result of simplifying the warrior persona into a single key attribute, a cultural shorthand, while the indigenous southern coinage representing a higher proportion of warriors carrying spears than swords (Hunter, 2005: 45) may be a more accurate reflection of the reality of weapons use in the IA.

Unexpectedly, there is an almost equal proportion of hoards found in the IA as the LBA in this dataset – although since York (2002: 79) notes that variations in terms of dredging practice, removal/purchasing of objects, preservational factors and material getting overlooked or ignored will have led to only a fraction of the original corpus of wet-depositions (far more common in the LBA than the IA) being found, it is possible the percentage of LBA material in hoards should be higher. It is also quite likely that the nature of, and motivation behind, those hoards changed between the two periods, since although bundles of weapons are found in the IA, there is less emphasis on relative positioning of weapons within the hoards and less apparent requirement to place them in wet contexts. At least 40 weapons from the LBA originated from wet contexts, in comparison to 11 from the IA (and 10 of those all came from the single deposit in Carlingwark Loch), while although some IA hoards show clear care was taken in their preparation and deposition, none appear to show any particular ritualistic positioning. In contrast, 7 spearheads, 10 swords and 5 shields were deposited this way, the swords placed vertically in the ground, point down, while the shields were placed on their edges in a circle. Thus, aspects of weapon hoards in the LBA appear more ritualistic than do those dating to the IA. It is possible that some of the IA hoards were deposited for non-votive purposes, such as political or social developments.

The weapons chosen for hoards are interesting. Hunter (2005: 60) raises the possibility that spears may have been less desirable weapons in terms of symbolism due to the ambiguity of their use and status, hence the use of the sword

rather than spear as a social code for 'warrior'. Sealey (2007: 37) contests this on the grounds that evidence for hunting from the IA is rare and may have been an activity explicitly linked to high status individuals, a situation that is certainly suggested in the EHP (see section 6.6). Hunting may have been an elite activity in the IA, enhancing the status of spears, but the possibility of cultural constraints on throwing weapons suggested in section 7.3.2 would indicate that that status might only apply to the larger spears, the smallest spears most appropriate for throwing may have been less symbolically valued. Furthermore, there is no indication that hunting represented a form of social division of activity in the LBA, but during this period it is possible to see considerably more variation in terms of elaboration of morphology. It seems likely that large, elaborate spears – which might reference the wealth of the owner, a socially acceptable form of combat, and hunting for large, dangerous animals – would have more symbolic cachet than their smaller counterparts in both periods. That supposition appears borne out by examination of this dataset. If uncommon spears are identified through unusual treatment (such as burning), elaboration on the blade (such as emphasised ridging on either side of the midrib) or a particularly unusual shape, then 50% of the LBA hoard spears, and 61% of the IA hoard spears, are unusual in some way. This is in comparison to the 42% of 'special' spears within the general LBA population, and 30% in the general population of IA spears. In particular, the proportion of unusual spears in IA hoards is much higher than the general population, suggesting these may well have been warrior spears, as Hunter (2005: 60) proposes.

It is difficult to fully compare the context patterns of northern Britain to the south or the Continent, given that there has been no similar work providing the necessary data for the spearheads, while contextual proportions were not included in Colquhoun & Burgess' (1988) work. However, the data drawn from Stead's (2006: 80-81) discussion of IA contexts indicate that the proportion of swords found in burials in southern Britain is roughly equal to that shown on the graph above – although that would indicate that generally northern British swords are less likely to be found in burials than in the south, given the distortion of the data caused by the weapons burials of region 6. Stead also found that the proportions of swords found in hoards in northern and southern Britain are roughly equal.

The associations between the components of the weapons panoply during the LBA and IA are illustrative of the changing motivations behind deposition. None of the weapon burials from the LBA contained more than one weapon, so the associations detailed below all originate from hoards:

LBA	**Spear** (%)	**Sword** (%)	**Shield** (%)	**Two or more components** (%)
Swords (53)	25	62	0	13
Spears (84)	61	13	0	26
Shields (10)	0	0	100	0

Table 18: Associative material of LBA hoards in northern Britain

However, during the IA, associations are found in both burials:

IA (total number from burials)	**No Association** (%)	**Spear** (%)	**Sword** (%)	**Shield** (%)	**Two or more components** (%)
Swords (20)	30	15	0	15	40
Spears (53)	21	0	0	0	79
Shields (7)	14	14	0	0	72
Armour (1)	0	0	0	0	100

Table 19: Associative material of IA burials in northern Britain

And hoards (where the the associated items in the hoard are combat items):

IA (total number from hoards)	**Spear** (%)	**Sword** (%)	**Shield** (%)	**Two or more components** (%)
Swords (12)	0	0	0	100
Spears (47)	0	0	0	100
Shields (1)	0	0	0	100
Armour (1)	0	0	0	100

Table 20: Associative material of IA hoards in northern Britain

[Note: Table 19 contains a certain level of discrepancy in that some weapons have

associated contextual information suggesting they were found with other weapons which are no longer extant, and therefore could not be included in the database. See section 2.3.3]

During the LBA, where weapons are found in association they are likely to be of the same type: swords mostly deposited with swords and so on. This is most common with shields, whose only associations are other shields. This may be because the depositional message inherent in each type of weapon is the crucial factor – the depositions do not commonly reflect the range and proportions of weapons that might be carried by an individual, and are therefore unlikely to reference an individual in particular. Where there are multiple deposits of one type of weapon, it is possible that the purpose is to amplify the message conveyed by that weapon; in which case, deposition of panoplies would weaken the intended effect. In contrast, the fact that IA hoards always consist of 3 or more varied weapons suggest that volume may have been the key message, intended to display wealth through a form of conspicuous consumption. The symbolic power of the weapons themselves are thus less important than their quantity and, presumably, value. This picture is supported by the associations found within burials. The majority of weapons in burials were either single depositions, or in groups of 3 or more. The latter may again be an expression of conspicuous consumption, this time explicitly linked to a particular individual, while the former may indicate those individuals who were not sufficiently wealthy to warrant a wider range of deposits, but were intended to be identified as a warrior – the single weapon acting as the symbolic indicator of a warrior, particularly where that weapon is a sword, as occurs in the majority proportion of single weapon burials (discussed above in relation to warrior graves).

The conclusions drawn must therefore support those discerned in the discussion of the development of warrior burials: during the LBA, deposition of weapons has a strong votive, ritualistic element to it, the weapons apparently containing inherent symbolism that was not necessarily directed related to their functional use during combat. The symbolism of IA weapons deposited in burials, in contrast, appears firmly linked to their functional combat use, supporting the concept of an idealised

warrior identity. However, multiple deposits in both burials and hoards suggest a strong drive for conspicuous consumption amongst elite groups, in which the symbolism of individual weapon types appears less important than the quantity and value displayed.

7.2.2 'Killing' of weapons

The deliberate and violent destruction of certain weapons immediately prior to deposition, in both the LBA and IA, has rightly led to considerable thought on the reasons behind such behaviour. These range from religious or functional motivations to the attempt to substitute such weapons for either warfare generally or the human body (Ralph, 2009).

The practice of 'killing' weapons prior to deposition is widespread, if not common. Although examples of 'killed' weapon are known across Britain (Dent, 1983: 123; Gilmour, 2007: 32), in addition to other ritually destroyed items such as the Parisi chalk figurines (Stead, 1988: 25) and the Deskford carnyx (Hunter, 2001: 84), probably the most well-known instances originate on the Continent. A number of folded weapons have been found at the sites of Nécropole do Olival do Senhor dos Màrtires, Santa Maria do Castelo and Alcácer do Sal in Portugal (Freire, 2005: 196, 198), while a huge number of the weapons from Illerup Ådal in Denmark and Gournay sur Aronde in France show similar treatment (Ilkjær, 2002: 35-36; Brunaux & Rapin, 1988). A small proportion of weapons from northern Britain also display evidence of this practice, although it is possible that the number of both LBA and IA spears which were ritually damaged would be far higher if snapping the shaft was considered to have the same effect, and the organic evidence remained.

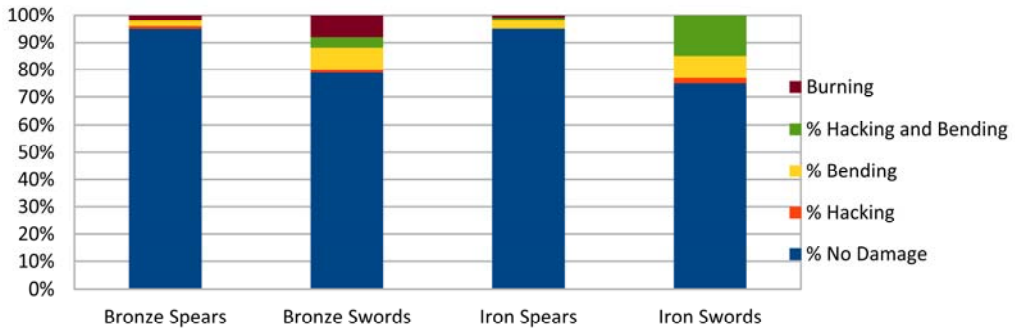

Illustration 28: Proportion of purposeful damage types on the weapons of northern Britain

Clearly, although the proportions of weapons with such damage are all relatively low, swords are significantly more likely to be subject to such treatment than spears – possibly due to their unambiguous status and symbolism (see sections 7.3.2, 7.3.3 and 7.4.2). Bending and hacking are methods more likely be used in the IA than the LBA, where burning is more common. This, however, may be a practical rather than ritualistic decision, since Maxen (2008) notes that the heat required to warp an iron sword is far greater than that needed for bronze; if it could not be done relatively easily, then it is possible that an alternative method of destruction might have been required. Further, high levels of corrosion in the iron population makes identification of burning difficult, and therefore this form of damage may be under-recorded.

Although weapons are destroyed in this way, other forms of metalwork are not (Harding, 2007: 133), and therefore the variety of motivations for such depositions focuses less on the rather vague concept of 'votive', and more on practical and social issues relating to conflict. Some weaponry may have been destroyed for the entirely practical reason that its presence acted as a danger, and those who destroyed the weapons wanted to ensure they could not be used against them in the future. Such an occasion is likely to have been spurred by recent conflict, and therefore one might expect such weapons to be used, although sadly all the destruction processes save bending would mask such damage. However, both the bronze spears and 5 out of the 7 bronze swords exhibiting bending also evidence combat damage, making such a supposition entirely possible. There may be a further, ritualistic reason, since Pryor (2003: 276) notes that depositing metal that

has been heated to warping point into watery locations will cause significant hissing and steaming – therefore the act of burning would not be inherently meaningful, but rather form an element of theatre, intended to draw attention to the deposition itself. Neither, explanation, however, adequately explains all of the destructive practices through both periods.

An alternative proposal revolves around substitution: ethnographic and textual evidence indicate that in some societies substitution allows a person of low importance (a child, slave or woman, for example) to be killed as a substitute for someone else or to achieve a particular objective (Ralph, 2009) – in this case, averting or ending a conflict. However, there may be reasons why using a person as a substitute would not have been acceptable in either significantly socially stratified or egalitarian societies. In the former, a low-status person may not be accepted as of equal value to a high-status person, while in the latter there may not be a group within society of sufficiently low status to qualify them. Under such circumstances, alternative methods of substitution which were less socially drastic might be sought – such as the substitution of weapons for people. In this case, the destruction *of* weapons may be a substitute for destruction *by* weapons (Osgood, 1998: 18), and the degree of prestige attached to killing the object possibly relating either to the degree to which the weapon shows elaboration and decoration, or to its association with a particular individual or community. This practice might be more likely if weapons were indeed being anthropomorphised in some way, as is speculatively discussed in section 7.3.3, or if (particularly in the IA) weapons were possibly considered as psychological and social extensions of their owners. Gilmour (2007: 32) notes examples of British swords deposited into both wet and dry locations while draped in cloth (either linen or wool), which he believes may mirror the deposition of dead humans. Given the practical and symbolic value placed on both weapons and the warrior identity during several of the periods under discussion, it is more likely that the 'killing' of weapons, if done as a form of substitution, marked a symbolic end to violence, rather than bringing that end about by itself.

Should substitution be taking place, one might expect to only find evidence of

'killing' of weapons *or* ritualistic killing of people; they would only be taking place during the same period if the motive for both were different, and the 'killing' of weapons was intended to mark the end of a conflict, while the ritualistic killing of a person was intended to prevent it. Unfortunately, testing the theory is hindered by missing data and too high a degree of speculation. Firstly, evidence for ritualistic killing is usually only evident where the individual has been preserved in anaerobic conditions (such as the Lindow man), so it is likely to be highly under-represented. Secondly, any analysis would rely on assuming that such individuals were killed for substitution reasons. Therefore, weapon substitution can only be proposed as a possible explanation for the deliberate destruction of weapons before their deposition.

7.3 “Life”

The 'life' of a weapon is usually the most opaque stage of its existence. Circumstances of deposition (when they are available) are a relatively straightforward source of information, while much can be inferred of manufacture through simple examination. Events between these two points are more difficult to ascertain, although there are a number of topics that might be considered; firstly, although weaponry is generally considered an indicator of the status of those who used and deposited it, the status of the weapon itself – particularly in relation to other weapons – is rarely considered. The relative numbers of components of the weapons panoply, and their depositional context, can shed light on this issue and on the way it may change over the period under discussion. Furthermore, there are also indications that aerial weapons were not only of lesser status than other types, but may even have been considered as culturally unacceptable for use during warfare. Secondly, it is possible to identify evidence of occasions when weapons were used in a functional way, either through varying forms of damage to the weapon itself or through osteological evidence, indicating one aspect of the weapon's role in life. Thirdly, we can identify another aspect of the life of the weapon – involvement in the religious, ritualistic and mythical aspects of a community. Aspects of the practice and iconography of warfare indicate that the concepts of birth and life were to varying degrees intertwined with the concepts of conflict and death, and the weapons not only represent this but may also have been

imbued with a sense of identity and personality, in their own right or as an extension of that of their owner.

7.3.1 Weapons and status

There exists a large corpus of publications on general social status and hierarchy within Britain, although it is unfortunate that so much of that work focuses on the IA and afterwards, at the expense of the LBA (Piggott, 1982; Cunliffe, 1995; Watts, 2005). The presence of elites in prehistoric Britain are generally held to be unproblematic, although Hill (2006) questions the validity of the 'social triangle' model of society, arguing for a societal model with a far flatter structure and suggesting that the forms of evidence usually taken as evidence of status, such as elaborate metalwork, were in fact symbols of office and marked the status of the community, rather than the individual. This rather egalitarian model is disputed here on both anthropological and evidential grounds: the anthropological studies of motivations for conflict discussed in Chapter 2 suggest the essential self-interest of humans, and it is unlikely that during the periods under discussion those who were militarily successful would not exploit that for their own ends. The evidence also suggests a degree of social hierarchy: while weapons may have been symbolic of, or for, a community, that does not exclude them from also being the functional possession of an individual who would also exploit such a possession to improve their own standing. Finally, many weapons are found within the same context, suggesting they were deposited together by a single group, but gradations in the complexity of bronze castings and decoration of IA blades and scabbards indicate a level of social variation *within*, as well as *between*, communities.

While a level of social variation within northern Britain is therefore visible during most periods, a topic given less consideration is the relative status between the weapons within the panoply, usually because swords and metal shields are considered the zenith of militaristic display, while spears and organic shields are routinely considered “mundane” (Harding, 2007: 166) – where they are considered at all. That assumption will have an effect on the interpretations of the status of societies and individuals when proportions of such weapons are analysed from sites, hoards or burials, and it is therefore worth determining its accuracy. The

most straightforward avenue of investigation is to consider the relative proportions of each weapon, during each period:

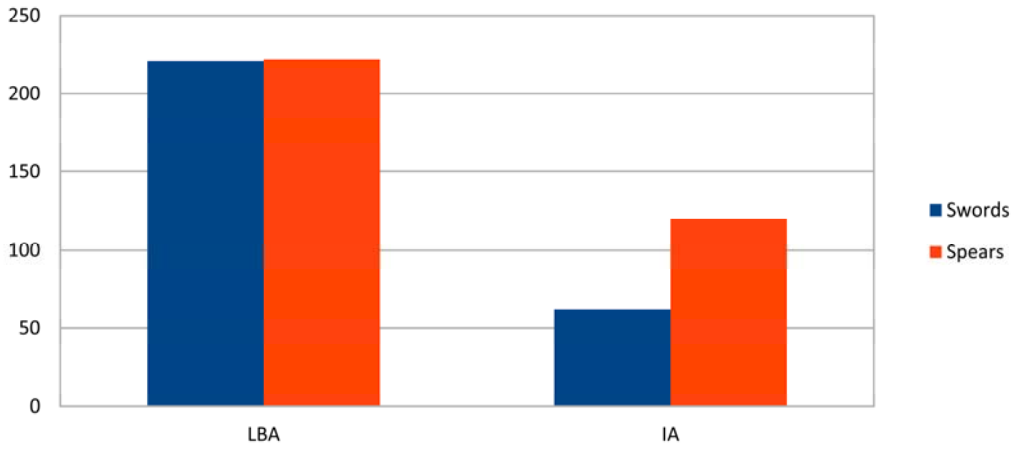

Illustration 29: Relative numbers of weapons in the LBA and IA of northern Britain

If there are social hierarchies evident in a particular society, it is not unreasonable to assume that within any groups of combatants drawn from that population there will also be a degree of social differentiation. Even where combatants are drawn from a social elite, even within that group there will still be a 'pecking order'. Swords are usually unproblematically considered the preserve of the most senior warriors, while spears are thought to be the weapon of the more junior members of the group. This is based on the assumption that a spear carries less status than a sword, either due to expense incurred in its manufacture, its symbolic importance or the fighting styles that are necessitated by each weapon (where adequately wielding a sword is thought to require more skill than a spear). However, none of these factors are necessarily correct during the LBA. Some of the more complex spears, such as BSP200 (found at Denhead in Perthshire), would have required far more time, skill and very little less weight of metal to manufacture than a small, simple sword, such as BSW113 (found on Skye). Despite Underwood's assertion that “the spear would have had limited use in single combat” (1999: 6-7), Chapter 4 demonstrated the complexity and subtlety possible with spear use, and the training required – as does Pittman (2007) in his discussion of Hoplite use of the spear. It is harder to determine the symbolic importance of the bronze spear; the graph above clearly shows that spears were produced with the same quantitative frequency as swords (had one group been far smaller than the other it might have

suggested rarity value and a higher degree of symbolism). A possibly more nuanced way of considering the relative status of such weapons is by looking at the composition of some of the large hoards (containing at least 4 or more weapons of the same type – note that the Grosvenor hoard was said to have been found containing 14-15 swords, only 6 of which are now extant, but the lower

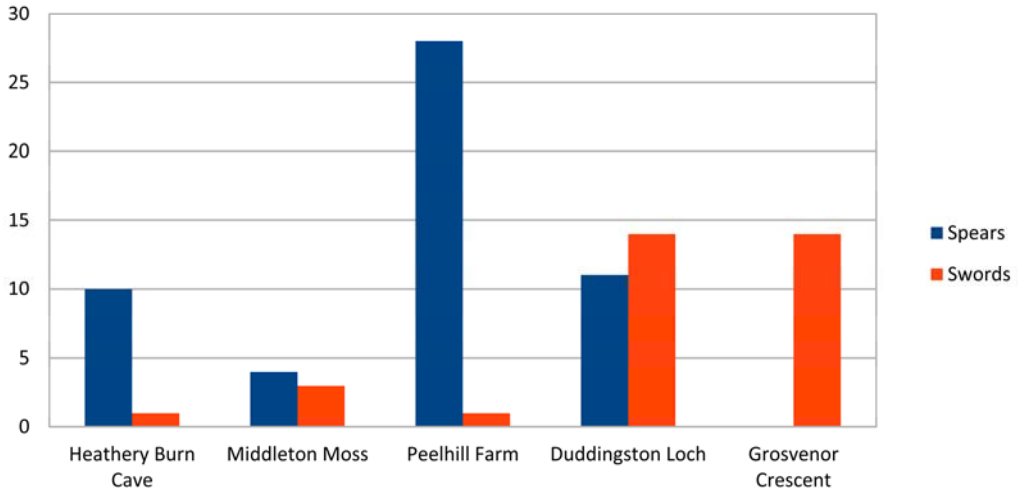

Illustration 30: The composition of large hoards in northern Britain original number has been used here):

The graph indicates no distinct patterning; clearly hoards can be dominated by either swords or spears, but where there is a mixture, it is more likely that the hoard will contain significantly more spears than swords. The former point suggests a degree of parity in status and symbolic worth, while the latter may be indicative of the composition of an idealised individual's weapons panoply, the status relationship of multiple individuals making a deposit, or the value placed on each type of weapon. Although they have not so far been found in the same highly ritualistic depositional positions as the swords from the Island of Shuna, Thrunton Farm or Ewart Park, some British metal shields, including the Beith shield from the north, were deposited with possibly ritualistically produced spear damage. The equal numbers of swords and spears found in the LBA, their relative representation within large hoards, and their proposed methods of use, suggest a level of parity in terms of status between the weapons, although there are some indications that swords may have embodied more symbolic worth.

That suggestion of near-parity does not continue into the IA, not least because the relative numbers of swords and spears changes so dramatically. We now see almost twice as many spears as there are swords, which appears to be a widespread phenomenon and not solely localised in northern Britain, since roughly the same proportions are also identifiable in IA Danish bog deposits (Hunter, 2005: 43-4). With a small number of exceptions, mainly those found at South Cave, the IA spears are small and simple (see chapters 3 and 5); they would consume less time and resources during manufacture than would a sword; and unfortunately, any decoration that may once have existed, such as blade engraving or shaft decoration, is now invisible. In contrast, at least 15 of the swords are extremely ornamental in their scabbard and hilt forms, and had more of these survived the number might be far higher. Although one might reasonably conclude that spears are not equal in status to swords in the IA, that does not imply that they had none. Finney (2006: 28-29) makes several key points regarding the presentation of spears in the *Táin*, notably that metal-tipped spears are never associated with non-elite individuals, and that spears are often ascribed desirable qualities for a warrior. He goes on to state that they may have been considered liminal items with a fluid social position, in that they did not convey their own inherent message but acted as emphasis for the weapons and individuals associated with it.

A group of artefacts not included in the dataset for this study are aerial weapons (discounting thrown spears) – slings and arrows. This is because they are almost, if not entirely, absent from the record for northern Britain (in contrast to parts of the south) (Armit, 1997: 49), and evidence from the IA suggests that this absence relates to the social status of these weapons. Certainly the presence of huge amounts of slingshot in southern Britain is well known – around 20,000 slingshot stones were found in the excavation of Maiden Castle (Redfern, 2005: 334). In addition, Caesar noted that the Gauls slung moulded bullets of hot slag and burning darts at their enemies during battle (Ritchie & Ritchie, 1997: 52). Thus it appears that in some areas, aerial weapons were common and, presumably, socially acceptable. However, passages from the *Táin* suggest that such weapons could also be considered unsuitable for warriors (Finney, 2006: 23-24); slings are

associated with youths and adolescents (as Redfern [2009: 416] also found when examining osteological evidence), or with warriors when they commit a dishonourable act, while arrows are never used by heroes or other characters. It is also possible that such weapons were present in the north, but were associated with guarding herds of domestic animals, and therefore not suitable as a weapon for an elite warrior. The lack of evidence for slings and arrows in a military context in the north may therefore suggest a cultural taboo on killing at a distance, or a profound lack of status for that form of weapon – which would suggest that either an exemption was made for throwing spears, or that spears were not thrown. What is clear is that the relationship between elements of the weapons panoply, and the cultural associations of the different weapons, is more complex than was previously thought.

7.3.2 Forms of use

Much is sometimes made of the argument that the existence of weapons does not constitute proof of combat taking place (see Chapter 1), and this is technically true. However, there are a number of ways in which it is possible to identify that the weapons in this dataset were physically used in combat to cause damage. Actual modes of use are thoroughly discussed elsewhere (Ritchie & Ritchie, 1997; Molloy, 2006; Anderson, 2011; Chapter 4), but here the concern is determining precisely how use can be identified.

Both Kristiansen (2002) and the results of Chapter 4 indicate that bronze weapons are vulnerable to damage when used in combat, and therefore wooden practice weapons are likely to have been used in training (as wooden 'wasters' are used today). A LBA sword made out of yew wood and found on Orkney would generally support this supposition. At 795mm long, it is larger than most contemporary swords, has an integral hilt, and is therefore not suitable for use as a mould for casting (Stevenson, 1957: 191), nor does its material make it suitable for actual combat. However, Stevenson notes that the handle is polished through handling, meaning it could have been a training weapon – which by its nature implies that its users were training for a reason.

More direct evidence for use can be garnered from the database in terms of edge damage, broken rivet holes and snapped hilts. Osgood (1998: 88) found it very difficult to detect different or changing fighting styles in the LBA simply through examination of the metalwork, and the intention here is not to try, only to demonstrate that use did occur and suggest reasons why the evidence presents in a particular manner. Edge damage is the most obvious thing to look for, although Chapter 4 makes it clear that such damage depends heavily on the type of combat taking place: lack of edge damage is not necessarily evidence that a weapon was not used. However, 31% of the examined bronze spears and 66% of the examined bronze swords do show evidence of such damage. When broken down into the edge damage on specific weapon types (of those weapons that were examined and in a good enough condition to identify such damage) (see below), although there is variation in the proportion of damaged members within each type, only the Gundlingen swords always show use damage (the types 1 and 9 spears are only represented by 1 artefact each, as is the Limehouse sword which was never used). The other types appear to have been deposited presenting a mixture of use wear and no use wear.

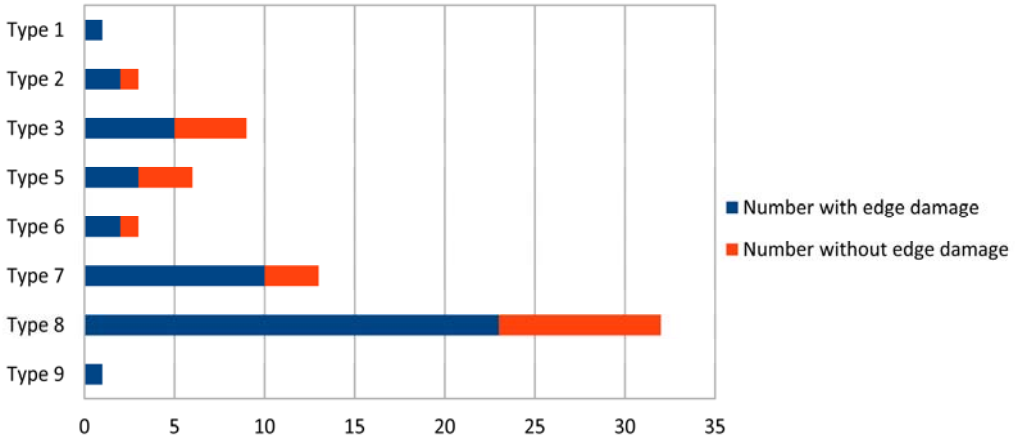

Illustration 31: Proportion of edge damage on LBA spearheads of northern Britain

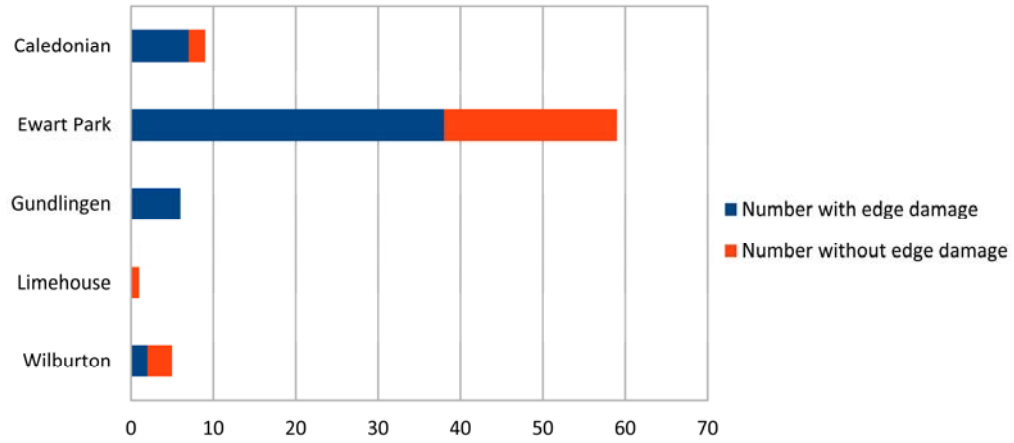

Illustration 32: Proportion of edge damage on LBA swords of northern Britain

There is no evident regional patterning between the proportion of edge-damaged and non edge-damaged spears and swords: variations in cultural practice or levels of regional violence cannot be identified through the presence or otherwise of edge damage.

Although bronze spearheads do not appear to have particular areas vulnerable to use, Osgood (1998: 13) believes that rivet holes on bronze swords are likely to have been a weak spot, liable to tear when used in combat. Of the 8 swords in the database with torn rivet holes, 1 shows no combat damage, 5 are too damaged through corrosion or burning to identify damage, and 2 show slight damage, which is inconclusive when considering whether torn rivet holes really are evidence of use. A more useful approach might be considering the proportion of the 45 swords with broken or repaired hilts that are edge damaged, although in this case these

simply indicate an almost identical proportion of edge damage as the general population of LBA swords:

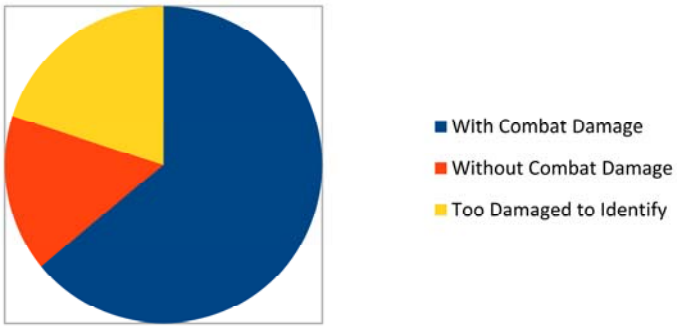

Illustration 33: Proportion of edge damage on LBA swords of northern Britain with broken or repaired hilts

An interesting aspect of the above table is that there were three swords which had their hilts repaired, but then were deposited with undamaged edges. It is possible that these swords suffered the damage post-deposition, or that the repairs were the response to a casting flaw, but a hilt failure under combat conditions does seem the most likely explanation. Where repair indicates the sword snapped during its lifetime, the question is why was it repaired only to be deposited without apparently being used again? Since there is clearly no prohibition on the deposition of damaged swords, such swords may have belonged to individuals who either could not or would not need to fight again in their lifetime.

It is one of the most unfortunate and frustrating effects of the preservation of iron weapons that their corroded nature prevents any analysis of specific use-wear. Therefore, it is only possible to identify usage in this way for the LBA material, and we may only draw similar conclusions about the use of the IA material from textual sources, iconography, and osteology. Fortunately, although a lack of catalogued source osteological material makes such analysis difficult (see Chapter 8), there is some published and relevant northern British osteological evidence proving that iron swords and spears were indeed used as weapons to injure humans. A synthesis of the known examples from Dent (1983), Stead (1991b) and Boylston (2000), all from Yorkshire, is as follows:

Sex	Age	Damage	Site

F	45-50	Cut two inches long on frontal bone	Danes Graves
?	35-40	Cut to left parietal, 1.5inches long and 1/10	Danes Graves
?	60	6mm hole in skull, possible puncture wound, and flattened upper vertebrae, possibly from blow	Garton Slack
?	?	Spearhead entered back of body and left near heart	Burton Fleming
?	?	Spearhead still embedded in pelvis (fatal)	Burton Fleming
?	?	Unknown weapon still embedded in vertebrae (fatal)	Burton Fleming
M	17-20	Sliced right occipital, consistent with sword cut	Wetwang Slack
M	20-24	Healed or partially healed depression in right frontal, 11mm diameter and 1mm deep	Wetwang Slack
F	25-35	Spearhead in stomach, abutting spine	Wetwang Slack

Table 21: IA osteological trauma from northern Britain

Even here, there is some level of disagreement between the two in terms of numbers and analysis, which would make an over-reliance on such information unwise, as would the restricted origin of the evidence (all of this material derives from region 6). With these provisos, some tentative inferences can be drawn from this table. Firstly, iron spears are used in combat and are not simply hunting weapons. Secondly, there is a cluster of younger victims and a cluster of older victims; simplistically, one might assume either that combatants could be older than was previously considered, or that non-combatant members of the population were at risk from such violence (as suggested above). However, without more information it is not possible to determine whether the older individuals died from the wounds in question, or whether these were sustained in youth but subsequently healed. A final trend is that half of the sexed individuals are female, supporting the possibility of female participation in violence or presentation as an at-risk group,

although, since there are only 4 sexed skeletons, such a conclusion is only tentative.

One of the reasons that osteological evidence of trauma may be so underrepresented in the record is because those killed in battle were selectively chosen for burial in ways that left little trace (Hunter, 2005; James, 2007: 162). For example, despite the huge casualties recorded in the second Punic war in Italy, the osteological evidence remains hidden (James, 2007: 162). Furthermore, given how easy it is to kill or severely wound without leaving any trace on bone (see Chapter 4 and Fig. 18), it is possible that rates of violent death were high but remain invisible.

7.3.3 Religious, ritualistic and mythical aspects of weapons

Both Osgood (1998) and Carman (1999) argue persuasively that warfare was a highly ritualised activity, the weapons acting as powerful symbols and the battles existing as cultural performance as much as a functional activity. This is seen most clearly in the association of weapons and warfare with nakedness, phallic imagery and sacred activity, in addition to the possibility of the weapons developing their own personas and identity. The evidence for such concepts is not inherent in the material of the database, but can be found in other sources whose evidence applies to that material.

The first ritualistic aspect of warfare is the explicit link between phallic representation and warriors in LBA iconography. The Roos Carr (east Yorkshire) figurines have already been mentioned, and certainly the pubic hole would allow for the warriors to be presented as definitively phallic. Some of the images of warriors in Scandinavian rock art are rampantly phallic, and their stylistic similarities with the Roos Carr figures allow their consideration here. Oddly, not all of the figures holding weapons depicted in that rock art are depicted with erect penises (or possibly penis sheaths, as suggested by Bevan [2005: 130-132]), which must pose the question whether the other figures are female, or whether the inclusion of the phallus represents something else entirely? Harding (2007: 117)

writes that “a connection between virility and martial prowess is enough of a commonplace for us not to need question it in these depictions” but it is not necessarily that simple. Bevan also notes that two hostage scenes within the Val Camonica rock art depict armed warriors standing over a possibly bound prisoner. The warriors are all phallic and the prisoners are not. Given this, and the fact that warriors are presented without the phallus, it suggests that the phallic presentation here relates either to power and seniority (social or physical) or directly to gender, rather than to the identity of 'warrior' itself. Phallic representations in iconography continue in the IA, in the form of the Parisi chalk figurines (again from Yorkshire), on which the glans, urethral opening and corpus spongiosum is referenced on several. None of the 16 representations of warriors indicate female characteristics, and in addition to the overall morphology of the objects one has a beard and at least one has male genitalia.

In addition to the phallic associations of the Parisi figurines, the IA produces evidence that some warriors apparently fought naked, a choice that appears illogical given that it is unlikely to have improved the comfort or safety of combatants. Piggott (1982: 80) does not present his evidence, but states that warriors in the IA routinely fought naked; such a statement might be considered fanciful if there were not a variety of iconographic, and occasionally textual, sources to support it. Finney (2006: 23) and Hunter (2005: 46) cite classical sources, and these are mirrored by indigenous numismatic evidence (admittedly only from south east England and possibly incorporating Roman influence) depicting naked warriors. From the area relevant to this study, some of the chalk figurines of the Parisi are shown naked and bearing swords (but not spears). Such behaviour could be seen as a quirk, but Finney (2006: 23) notes the similarity between naked warriors and naked individuals ritually killed and deposited in bogs. Possibly the concepts of death and being given to the gods was connected to nakedness, making a state of undress appropriate to warriors who faced death. In addition, the lack of clothes would allow each individual to use their skin as an element of display (whether ritualistically or otherwise), either using woad or tattooing.

In a general sense, the combination of phalluses and nakedness during battle may well be the manifestations of imagery that links the concepts of birth and life in the midst of death in the mind of combatants. Further, there is an ingrained modern cultural association between the sword and phallus, and fighting to sex. If such comparisons held true in prehistory, then any warrior might count as a 'man' and any victim a 'woman', regardless of their physical gender. This is possibly why the captors are phallic and the captives not at Val Camonica – to be forced into submission and bound by a stronger warrior may have cancelled that individual's manhood. The general conclusions that may be drawn from this evidence are that women *might* actively participate in conflict, but socially and culturally it is a male sphere with androcentric imagery and connotations.

An equally ephemeral ritualistic aspect of LBA and IA weaponry is the possibility that weapons might come to be seen as entities in their own right, independent of the hand that wielded them. Clearly they held high levels of value in both periods, being deemed worthy of votive sacrifice in the LBA, while the prospect of forced disarmament of the Iceni at the hands of the Romans was sufficient to prompt a revolt in AD 47 (Cunliffe, 1991: 207). A variety of authors (Osgood, 1998: 3; Williams, 2001; Williams, 2002; Pearce, 2011) have posited that weapons were considered to have their own identity, suggesting personality and destiny within their life-cycles. Such identity could be expressed in the provision of a name, face, anthropomorphic form or eyes. EHP textual evidence does suggest the naming of swords (usually when the sword had proved itself in some way [Pearce, 2011]), although not usually spears: examples include Excalibur, Skraep (a supposedly magic sword used by a Danish prince to defeat a stronger, Saxon enemy), and Beowulf's sword Hrunting, while the *Táin* lists a number of swords, spears and even shields with names (Kinsella, 2002; Kristiansen, 2002: 330). During the LBA and IA, certain swords were created with anthropomorphic features. The hilts of LBA Antennenschwerter swords, one of which was found in northern Britain, are reminiscent of eyes, while the hilts of two IA swords, found near Ripon and North Grimston respectively, are anthropomorphic representations. These supporting examples are somewhat sparse as supportive evidence, although in a society where naturalistic art is rare, it is possible that the swords did not actually

have to be made to look physically similar to a human to reference personality. It is clear in the *Táin* that many swords (although not spears) are directly identified with individuals and possibly also represent them; if their own sword became lost it was not acceptable simply to take the sword of someone else (although such a sword could be given). Furthermore, such loss appears to have indicated emasculation of the owner and a loss of warrior status, returning them to the role of a boy, until they can recover their old sword or obtain a new one (Finney, 2006: 29). As such, it seems certain that particular weapons were considered as more than functional objects, as extensions of their owners themselves or symbolic carriers of their warrior identity, if not as individuals themselves.

7.4 "Birth"

7.4.1 Availability and sourcing of materials

The topics of metal sourcing and metallurgy are complex areas of research in their own right (Tylecote, 1986; Northover, 1988; Timberlake, 2003; Bayley & Ponting, 2008), but there are two key issues which are of particular relevance here: availability and sourcing. The degree of ready availability of metal ore with which communities in Britain could produce weapons will clearly have an effect on the volume of output, the type of objects created and their social significance. Bronze production primarily requires tin and copper, the latter being more widely available than the former. Copper was extensively mined right across Britain, particularly in the west (Pryor, 2003: 271). In many of these sites the mines or surface workings could be seasonally exploited by local communities for whom such mining formed only a part of their lives. The exception is the mine at Great Orme, which appears to have been a full-time mining site throughout the MBA and LBA and is thought to have yielded between 175 and 238 tonnes of copper over its lifetime, far more than the local community could have needed (ibid: 274). The distribution and volume suggests that the copper component of bronze would have been relatively widely and easily available. Obtaining tin was more difficult as this metal is notoriously limited in its mining possibilities, with the nearest source to northern Britain located in Cornwall (Kristiansen, 1998: 144).

Consequently, communities in northern Britain would have been forced to establish long distance trade routes, either to obtain the tin itself or to import ready made bronze or bronze objects. Northover (1988: 130) has argued that a significant proportion of bronze swords found in Britain were created from alloys that had been transported into the country from the Continent. However, it is very unlikely that a large proportion of finished weapons were imported due to the number and distribution of known LBA metalworking sites in Scotland, and the potential for more (Hunter et. al., 2006: 52-3). It is the difficulty of supply which would have significantly contributed to the prestige of bronze and the power networks associated with its supply, production and consumption, and which are briefly discussed in Chapter 1 and inform much of the discussion of bronze weapons in this thesis.

In order to obtain a broader understanding of these networks, repeated efforts were made in the later 20th Century to exploit the trace elements in bronze in order to determine the provenance of the original metal (Tylecote, 1970). The advantages of such an approach include determining the size and formation of trade and exchange networks, and indicating whether imports from outside of Britain consisted of metals, alloys or finished products. Unfortunately, as Tylecote himself notes (1970: 22), in cases where recycled metal has been used, there will not be a single, clear provenance and the approach becomes untenable. It has become increasingly clear that this is particularly problematic in northern Britain as the scale of recycling of bronze in the LBA becomes more apparent. However, the concept of analysing bronze objects based on metallographic composition was approached again by Cowie et.al. (1998) with rather more positive results. They found that the proportion of primary metals and inclusions in bronzes varied by area across the UK (Cowie et.al., 1998: 146-9), suggesting the existence of distinct smelting operations across LBA Britain. They also found some supporting evidence that those proportions varied according to artefact type which might indicate that particular artefact groups had "a different history of manufacture based on a different supply of metal" (ibid: 149). Similarities between the proportional trace elements within bronzes from different regions prompted the authors to posit the existence of zones within LBA Britain, where metal of similar

provenance would be circulated and recycled – for example, similarities between the St Andrews hoard and material from East Anglia suggest that the North Sea coast was one such zone. Further work identifying such zones and considering their implications might prove extremely informative regarding both the degree and nature of contact between areas of Britain in the LBA, and also the relationships and relative status or symbolism of components of hoards.

The availability of iron ore was far less problematic. It is found in Scotland widely on the surface in the form of bog ore – which was almost certainly the primary source of iron for IA communities – and also in geological veins in some areas (McDonnell, 1994: 229; Hall & Photos-Jones, 1998: 57). Given such plentiful source material, it is perhaps surprising that so little iron material is found on EIA and MIA sites in northern Britain; there is instead a widespread use of bone, bronze and stone for items such as pins, awls, gouges and combs (Cunliffe, 1991: 197). However, as suggested in Chapter 1, it is likely that intensive hoarding and recycling was taking place and therefore very little of the iron artefacts in circulation during that period were deliberately deposited. In a similar process to that used by Cowie et.al., (1998), Blakelock et. al. (2009: 1746) have found that particular slag inclusions can be linked to identifiable smelting systems (which vary depending on such issues as the specific fuel ash, fluxes and furnace lining) rather than generic geological ores. Although the theory requires pre-existing knowledge of the iron smelting and smithing operations in a given area, such an approach could be used in future research to indicate zones of circulation between the location of manufacture and location of deposition of iron weapons. This theory has been tested with positive results in Israel, and it would be interesting to ascertain whether a similar approach could be used in northern Britain.

7.4.2 Processes of production

The production process of weapons can provide a range of information, such as the value of the weapons arising from the investment of time and skill in manufacture, and indicate whether weapons were produced generically, or were made for specific individuals.

The processes of producing bronze and iron weapons are each labour- and resources-intensive, but in different ways. Northover (1988: 132) estimates the amount of time to produce a generic LBA sword as roughly 3 weeks, although personal experience suggests it may not always have taken as long. Using what seems to be a typical procedure, where a new clay mould is created, the weapon is cast, cleaned and edge hardened after casting, and a handle is attached, Neil Burridge, of Bronze Age Craft based in Cornwall, finds a week sufficient. The addition of a scabbard would, of course, extend that time somewhat. The skills, process and time required to cast bronze spearheads are very similar; although the shorter length makes the cast less difficult, the shape is more complex and therefore requires more intensive preparation in terms of the mould. Bronze shields require considerably more time and expertise in their creation. The manufacturing process proposed by Uckelmann (2009; 2011) suggests that a bronze disk would be beaten out to the required size and thickness; however, experiential evidence from professional bronze-workers suggest that for every 2cm it is beaten out it must be annealed slowly overnight to prevent brittleness. Furthermore, many shields exhibit complex decoration, significantly adding to the required skill and time required. Such an item would take a very highly skilled bronze worker several months to produce, prompting Uckelmann to note that perhaps archaeologists should be more concerned with considering who had the skills to make such items, rather than who might have had access to the finished product. Organic shields, whether of leather or wood, require considerably less skill, time and valuable materials (Coles, 1962; Molloy, 2006). The choice of which material to use for shields does not appear to have been functionally driven (see Chapter 4), and therefore issues of symbolism, display and conspicuous consumption are made visible where shields have been made of metal.

The process of smithing an iron blade is very different, with the majority of investment of time spent in creating the blade itself rather than the finishing processes, as occurs in bronze casting. Although Cole (2008a) suggests that almost anyone can make a blade with the right supervision, the activity itself can be very complex. At the most basic level, the smith welds bars of metal together to form the blade, but swords of high quality and strength are welded from alloys of

varying hardnesses in specific conformations. The process can take between a day and a week, depending on the skill of the smith, the structural complexity of the weapon and the degree of finishing required. The lack of research into the iron spearheads of the IA and EHP make it impossible to determine whether multiple alloy types were also used in their manufacture, but where there was equality in their structural composition the production of spearheads would inevitably been faster than that of swords due to scale. The level of resources required to smith iron is significantly greater than those involved in casting bronze because it involves considerable metal loss during forging – up to 66% – as well as requiring up to 100kg of oak, ash or hazel charcoal to maintain the correct temperature for the smithing of one sword (Cole, 2008b).

A point worth emphasising is that the skill of the bronze-worker or smith will be the key factor in terms of the time spent and the quality of the finished product, making analyses focusing too firmly on the specific time required for manufacture unproductive. However, when considering the quality of a finished object, there are two avenues to consider – the quality of the aesthetic finish (which is likely to denote hierarchies within the pool of end-users) and the technical quality of the object (which will indicate the levels of skill of available artisans).

The symbolic potency of weapons suggests that very rarely, if ever, would they have been created with a purely utilitarian appearance; indeed, the description in the *Táin* of Conchobor's treasure house as a "twinkling hoard" filled only with weapons and drinking cups (Kinsella, 2002: 5) implies that weapons were finished and decorated with aesthetics specifically in mind. Unfortunately, much of the finishing that might once have taken place will now be invisible. When the casting of bronze is complete, the metal is covered with a brown patina which must be abraded off if the metal beneath is to be exposed. This must be done carefully - rubbing too hard will cause scratching, but it is possible to achieve an entirely smooth and polished surface. This would have been the longest and most mindless (although not necessarily unskilled) task associated with bronze production, but apart from exceptional cases, the patina left by deposition or corrosion obscures the quality of this work – those like BSW2 and BSW29 even now convey an

impression of a highly polished finish. However, not all swords were necessarily treated in this way, as Hunter (pers.comm., 21/07/11) notes that deliberate patination may have taken place as a method of protecting the sword during its use; some evidence for such a practice may be found in those swords exhibiting a different patina on the hilt than is seen on the blade, as occurs on BSW14 and BSW63, although such differentiation is quite subjective to determine.

Another method of distinguishing weapons is the application of the hilt; aside from rare solid cast hilts (3 from northern Britain), bronze swords required organic sections and pommels to be riveted on, while the hilts of iron swords were built up of organic, and occasionally metal, sections around a central tang. The organic nature of the LBA hilt components has ensured their absence in the archaeological record; a gap in evidence more keenly felt due to the lack of decorative features on the blades. Strangely for a period so strongly associated with high status metalworking and its display, the swords themselves do not display obvious decorative metalworking features. In contrast, the ability and propensity to provide elaboration through the medium of metal is seen on many of the shields, using dots or lines, and some of the large and complex spears (in the form of ridging and lunate openings). Should there have once been decoration on the swords, that decoration lay with the absent organic components.

In contrast, sufficient hilt remains found on 13 of the IA swords provide an impression of the intricacy of these features. Exceptional examples include the anthropomorphic handle of ISW44, the remains of gold banding on the hilt of ISW65 and the enamelling on the hilt of ISW3. Interestingly, all of the elaborate hilts and all but two of the decorated scabbards were found in regions 4, 5 and 6 – in other words, all but two of the elaborate versions were found in England, rather than Scotland. Certainly the handles were likely to have been the most original aspect of the swords, since there was no single way of producing them (Russell, 2008; Osgood, Monks & Toms, 2000: 24); IA iconographic representations suggest it is likely that knobbed, pointed and T-shaped pommels could all have been used (Stead, 1988: 13). Another focus of possible decoration are the IA scabbards, their metalwork and enamelling frequently works of art in their own

right. Finally, although not evident on existing northern British swords, some of the southern swords bear decoration on the blade: 4 blades are covered in chagrinage, 1 has incised decoration and an inlaid stamp, while a further 9 also have stamps (Stead, 2006: 32, 48). No two swords have been found to have the same stamp, although some swords have been found with more than one stamp design. In addition, a number of the Illerup Ådal weapons (including spears) also bore incised decorations and stamps (Ilkjær , 2002: 44-47). General consensus is that these stamps were a mark of the blacksmith who made the weapon, much as was the practice in medieval periods (Stead, 2006: 49). Stead posits that there may have been more such stamps or forms of decoration on swords still within scabbards or on those heavily encrusted with corrosion products, and although speculative, it is possible that northern British blades might also have borne such decoration. It is also possible that the method of manufacture itself created a form of decoration, since Gilmour (2007: 23) notes that the early, informal style of pattern-welding evident in LIA weapon manufacture apparently deliberately created the impression of water flowing down the blade. Although a popular method of manufacture in some areas (over 90% of the Nydam sword deposits were pattern-welded [Gilmour, 2007: 25]), pattern-welding does not appear to relate to functional capacity but is instead an aesthetic choice. Despite a high degree of corrosion products obscuring evidence of this form of decoration, the more decorative scabbards and hilts taken together indicate that some of the norther British swords, such as the Kirkburn and Asby Scar examples, would clearly have been extraordinarily ornamental and powerful expressions of wealth and status.

In contrast to the aesthetics, the evidence for the technical quality of the weapons is available, if not particularly accessible. Poor quality casting on bronze weapons is sometimes visible as bubbling or stippling on the surface; the presence or absence of this, and the range in quality it suggests, was highlighted by both Bridgford (2000) and Davis (2006) in their analysis of swords and spears respectively, the latter even dividing some typological groupings on the basis of quality (although information on the quality of casting was not gathered for this database). Unfortunately, encrustation of the IA blades (or permanent encasement

in a scabbard) means that visual examination is inadequate to determine the particular smithing process or quality of these, although the value of more technical investigatory techniques is ably demonstrated by Lang's (2006) contribution to the Stead catalogue. The lack of surviving decorative features makes it impossible to link quality and finish in bronze swords, but research into the connection between quality, use-wear and depositional circumstances might shed light on the degree of importance attached to quality in the LBA. Similarly, a programme of study to determine the type and quality of the smithing of the IA blades could usefully be combined with the information on aesthetic decoration to gain a greater understanding of the connection between, and relative importance and significance of, finish and quality.

Finally, the form and size of the weapons in the database might provide information on whether they were being generically produced and then sold randomly. This seems immediately unlikely since the implication is that during the LBA and IA there were stocks of generic, ownerless weapons in circulation; the social infrastructure of these periods suggest that the creation of stock would be an improbable method of operation for artisans, and given the production time and costs it would have been impractical to embark upon creating such a weapon without a degree of certainty that it would swiftly find an owner. Further, the cultural importance and symbolism of such items do not imply that their production would have been a purely functional, mundane process; the profound connection between weapon and owner suggested in 7.3.1 is most likely to have begun at the stage of production. Should such weapons have been specifically commissioned by a particular individual, not only might the range of weapon sizes indicate the physical range of combatants, but it would have an effect on the period the weapon would be in use; normatively, would a spear or sword made for one person be socially and physically suitable for another person?

It is impossible to know what aspects of a weapon, such as particular decorative features or hilt forms, might make it socially appropriate for any given individual, but from a functional perspective the two key measurements which will determine its suitability for their use are weight and length. Although the use of shafts and

possibly ferrules make these highly adjustable in the case of spears, analysis of the relative blade and grip lengths of swords is of particular interest (for the precise location of measurements, see Figs. 2 and 3). When the blade lengths of the bronze and iron swords are plotted on a histogram the results mirror each other:

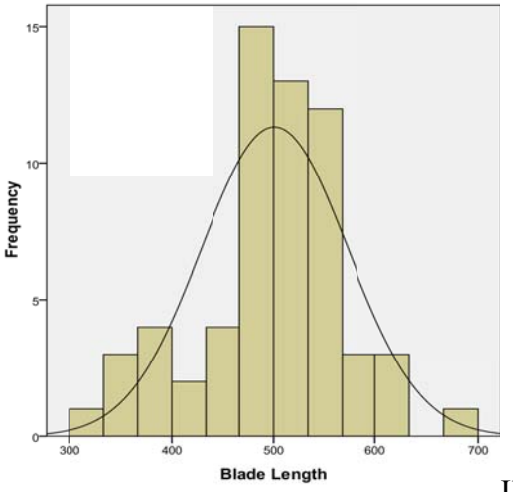

Illustration 34: Blade lengths of LBA swords of northern Britain

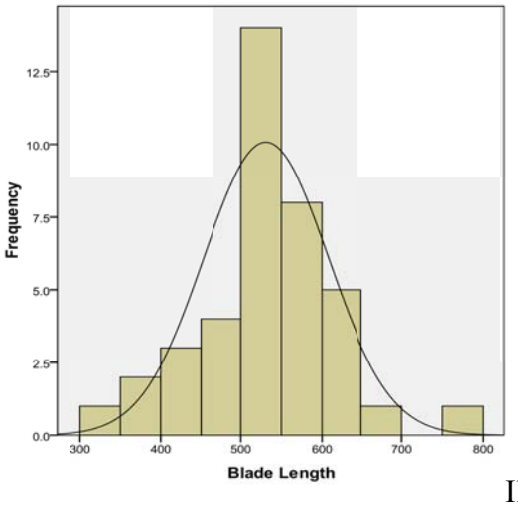

Illustration 35: Blade lengths of IA swords of northern Britain

Both plots roughly follow a normal bell curve, although they also show a certain level of unusual clustering at the centre of that curve. In addition, the bronze swords have a small 'peak' at the smaller end of the scale, in addition to the large peak at the centre. Clearly a range of sword lengths were being manufactured, and although the clustering along the average suggests over-manufacturing for the average the length differential indicate a significant element of fitting the weapon to the user.

The small 'peak' in the LBA swords is particularly interesting when considered in light of the possibility of both sexes wielding weapons. A histogram of the height range of normal male population will follow a regular bell curve, but when both sexes are included there is likely to be a 'double peak' effect if there is a height differential between the males and females of a population (Niall Anderson, pers.comm., 09/08/11). Although none of the osteological studies considered in Chapter 8 provide details of LBA or IA mean heights, Hill (1997: 553) does note that the mean height differential between males and females in the EHP was 76mm, and it is not unreasonable to suppose a similar difference existed in the LBA. The small peak here may therefore be indicative of swords made for female use, although if so there were clearly a smaller number of female than male combatants. An alternative interpretation for this feature, given the substantial length differential in both LBA and IA populations, is that short swords and long swords were being deliberately manufactured with different fighting styles in mind, much like the Roman gladius and spatha. Two potential methods of testing whether differences in use depended on length are examining the relationship of length to instances and location of combat damage, and determining whether there is any difference in the number or type of weapons panoply associations each group might have within burials (assuming the individual was buried with their own weapons; the components of hoards are less likely to indicate the weapons set of an individual fighter). Given that the blade lengths of the iron swords follow a normative bell curve, it would be meaningless to divide them, but the distribution of blade length in bronze swords shows two distinct groups – a shorter group whose blades are less than 470mm long, and a longer group whose lengths range between 471mm and 700mm. Analysis of each group can then determine whether there is variation in where any combat damage falls on the blade, and also whether there is any difference in the number or type of weapons panoply associations each group might have within burials (assuming the individual was buried with their own weapons; the components of hoards are less likely to indicate the weapons set of an individual fighter). The larger group contained 45 swords, with 16 in the smaller group. The figure below, presenting the percentage of instances of combat damage for each group on each area of the blade, indicates some distinct differences between the two:

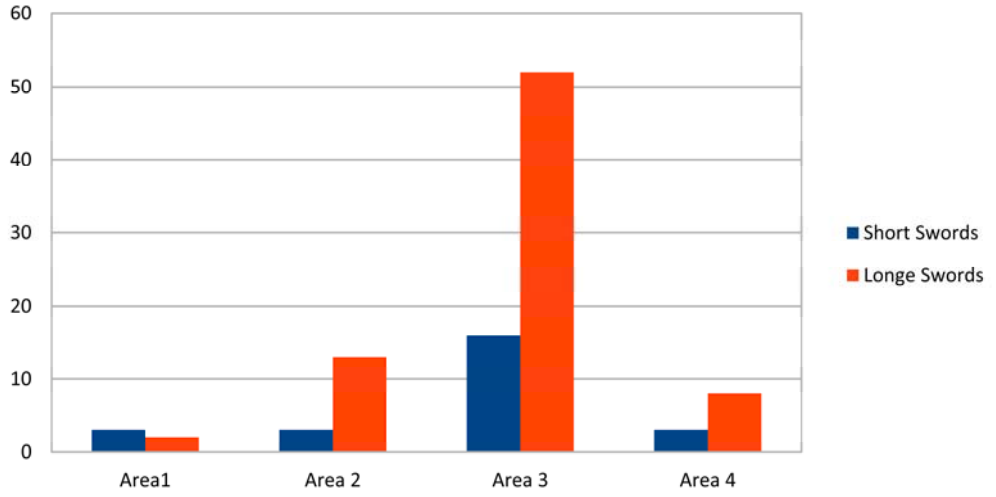

Illustration 36: Relative proportions of combat damage on the four blade areas of the LBA short and long swords of northern Britain

The larger swords show considerably more damage, and although both types show a clustering around Area 3, the longer examples also indicate more variability in the areas exhibiting damage. This may indicate that longer swords were more frequently used in combat, and used in a more varied way. The much narrower spread of damage on short swords may suggest that their use was confined to a particular style – possibly a highly ritualised form of fighting, rather than a 'free-for-all' in which unexpected and unfocused strikes and defensive moves were more likely. In terms of associated material, the LBA long swords were slightly more likely to be found with other swords and spears, although the short swords were slightly more likely to be found with another sword, whereas the long swords were more likely to be found with a spear:

	% Associated with Swords	% Associated with Spears
Short Swords	19	13
Long Swords	27	31

Table 22: Associated weapons of the short and long LBA swords of northern Britain

The associations of long swords may indicate a higher propensity to deposit these with proportions of weapons which reference a warriors' weapons panoply, while the higher proportion of sword than spear associations for short swords could possibly indicate a more strongly votive element to the deposition (fighting with two swords seems unlikely given that the contemporary iconography makes no

such reference). Although these are particularly provisional conclusions, since the relative differences in percentage proportions are all quite small, overall they do tentatively suggest differences in the way long and short swords were used, although they do not preclude the possibility of the shorter swords being designed for female use.

Although overall length will determine whether a weapon can be comfortably used by a person, another measurement which may be important is the grip length. Where normative practice is to ensure a snug grip, the length must be quite specific in size to avoid discomfort for the user; this form of use is likely to be indicated by the morphology of the hilt and a relatively limited range of grip lengths across the population. If the grip is looser, with more flexibility to move the hand around the handle, there is likely to be a greater range of grip lengths as the size becomes less crucial to get exactly right. In the latter case, differentiating user size based on the grip will be less accurate. The grips of the bronze swords only vary by 23mm (the smallest is 51mm and the largest 74mm), while their generally small size might suggest a requirement to almost 'wedge' the sword hand between shoulders and pommel for security (Kristiansen, 2002: 320). Anything unusual in respect of grip length distribution amongst this population is therefore likely to be of particular interest. In contrast, the grip length of iron swords is larger, both generally and proportionally in relation to blade length, ranging from 62mm to 145mm. There is no evidence for shaping of pommel or shoulders to closely cup the user's hand. Distributions are shown below, with LBA grip lengths on the left, and IA grip lengths on the right:

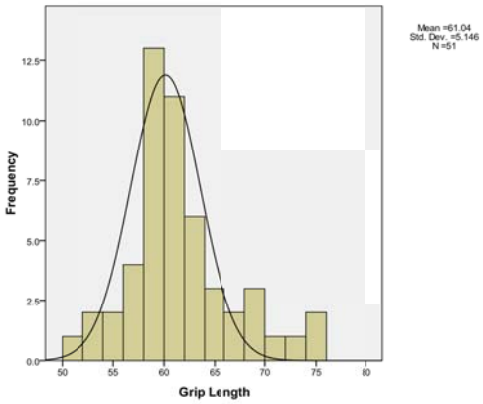

Illustration 37: Distribution of grip lengths of LBA swords of northern Britain

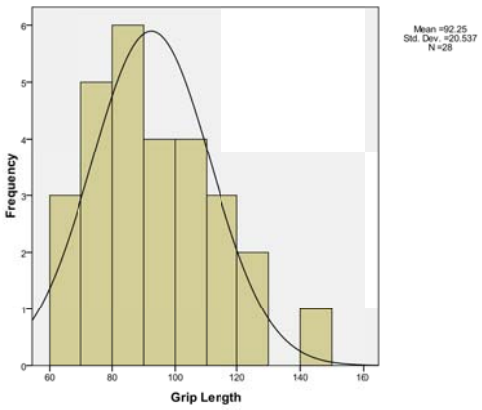

Illustration 38: Distribution of grip lengths of IA swords of northern Britain

Interestingly, while the LBA grips again quite neatly follow the standard bell curve, there is a higher than expected number of grips at the larger end of the scale, inversely mirroring the small 'peak' in length at the shorter end of the blade length curve. Aside from this anomaly, the remainder of the graph suggests that grip length in the LBA corresponds to height distribution patterns, supporting the concept that swords were manufactured to fit individuals. Consequently, that anomaly indicates the possibility of a larger than average group of swords being made for individuals at the tallest end of the height spectrum who could have physically wielded longer swords but made a deliberate choice to use a shorter blade. This in turn supports the suggestion that swords of different lengths were created for different use patterns. The IA grip lengths are more evenly spread and do not follow a bell curve, suggesting that grip length during this period did not relate to height or size of the user. Further, it is of particular note that not only is the range of grip lengths during the IA far larger than during the LBA, but even the longest LBA grip lengths are only at the very smallest end of of the IA scale. A possible explanation for this is that the method of grip changed to become looser, and therefore the range of sizes seen here are either an expression of preference or indicative of a different fighting style.

Perhaps oddly, given the patterning identified above, there is relatively little correlation to be seen when blade length and grip length are plotted against each other (LBA on left, IA on right):

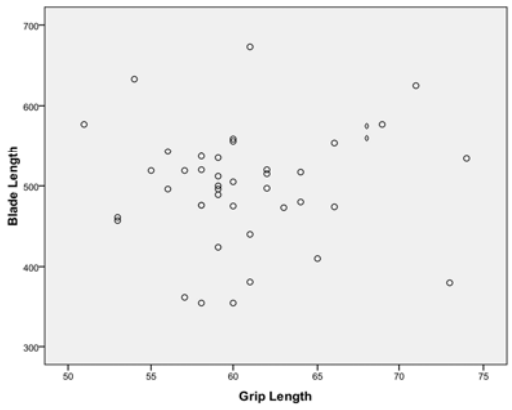

Illustration 39: Plot of blade length against grip length of LBA swords of northern Britain

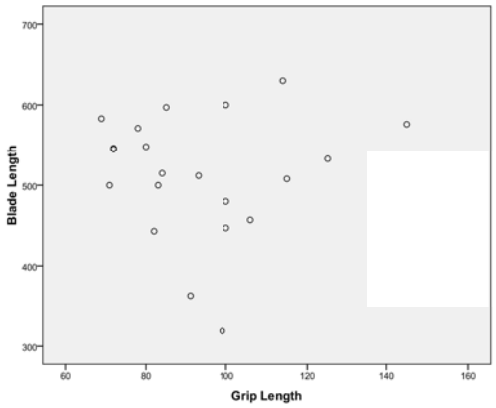

Illustration 40: Plot of blade length against grip length of IA swords of northern Britain

There is a rough correlation between the two during the LBA, albeit with a number of outliers across the spectrum, but the IA shows little correlation other than a clustering in the upper left quadrant, which only suggests that a long grip length with a short blade is rare during this period. Ultimately, the variability in size distributions suggest that not only were these weapons likely to have been manufactured for individuals, but also that a mix of genders (or possibly ages) may have used them and they may have been used in various modes of combat to suit their size.

A final indication that swords may have been manufactured for individuals arise from alternative interpretations of the blade stamps found on some southern British swords (see section 7.2.2). Both Vouga (1923: 36) and Livens (1972) suggest that the stamps could be the mark of an owner, rather than maker: if true, and each stamp was applied at the end of the manufacturing process (as suggested

by Stead [2006: 48]), the blacksmith must surely have known the identity of the future owner of the weapon. The varying number, location and morphology of stamps on each side may indicate either that an individual was represented not by a single stamp but by a combination, or that the sword may have been passed through several owners who each stamped the blade again – the three identical pig stamps on the West Row sword thus suggest the possibility of dynastic possession of the weapon, if the mark indicates a kin group, rather than individual. It is entirely speculative to consider this evidence in relation to northern material, given the lack of stamps on northern British swords, but should evidence of these stamps be found on blades from the north, it may become relevant.

Although the evidence suggests that most weapons during the LBA were created with a particular user in mind, the picture is more mixed for the IA. However, on those occasions where a sword was made for an individual it becomes marginally less likely that it would regularly have been handed down through generations as functional heirlooms, although still possible; Ilkjær (2002: 43-44) notes that none of the IA warriors represented in the Illerup finds appears to have fought with "out-of-date, inherited" weapons. Despite blade length in both periods varying considerably, northern swords still remained short compared to southern examples (Stead, 2006), making it possible that even a shorter person could wield one of the longer swords if required. Further, the relatively longer length of the IA grips suggest that these could also have been suitable for a wider range of people. The LBA grip lengths are more problematic, in that their shorter lengths provide less flexibility in terms of who might use them. However, the differentiation in size across the population is quite small, suggesting that – although not producing a perfect fit – such hilts could be functional to a range of users of different sizes. Finally, although the casting on of new hilt ends is usually considered to be a response to casting flaws or damage during use, the 13 such swords in the database may have undergone such work to change the grip length in order to make them more comfortable to a new owner after changing hands.

7.5 Chapter discussion

It is quite clear that the topics addressed in this chapter could form one, or even

several, theses on their own; each could be developed far further than the scope of this work allows. However, even the circumscribed treatment afforded them here has proved illustrative on a number of points. Firstly, although the general approach of this study accepts various sources of evidence as relatively unproblematic indications of warfare, its results must lead to a conclusion that the evidence presented here is at least as illustrative of the symbolic power and role of weapons, than it is of actual violence. The cultural shorthand by which some weapons were able to convey very specific messages, the potential anthropomorphising of weapons (by various methods) and the possibility of weapons acting as a substitution for both conflict generally, and individuals in particular, demonstrate that power.

One of the themes of this chapter was the challenging of traditional assumptions made regarding weapons. While swords quite clearly form an aspect of the warrior image, the weapons employed by real combatants did not always reflect the traditional hierarchy of high-status sword and low-status spear. Spears were commonly used, occasionally as high status weapons, and were not associated with untrained and non-elite individuals. Rules governing their use, display and deposition were possibly as regulated as those for swords, although they appear to have been barred from forming part of the warrior image.

While these points are interesting, it is also true that this chapter does have limitations, in particular the variability of available information. For each topic discussed, there is often sufficient information to allow consideration of one of the periods, areas or weapons, but not the others, resulting in analysis that is not always as thorough or well-rounded as it ideally should be. Although some of the missing information cannot be rectified (lost contextual details, for example), absolute dating in particular should be a focus for targeted programmes, which would facilitate a far more nuanced study than is currently possible.

A number of other approaches are also suggested for further work, particularly with a focus on northern Britain, since published work on the topics raised here (Sharples, 1991; York, 2002; Finney, 2006; Redfern, 2009) tend to concentrate on

southern Britain. A major advance in understanding of the material in the database will depend on technological examinations. Metallurgical investigations, into both zones of circulation and recycling of LBA metal and the technology used to create the IA weapons, would be extremely useful. The former would enable a greater understanding of the possible variations of originating zones within the contents of individual hoards, or possible variations of originating zones of particular artefact classes. The latter would expand on the circumscribed work conducted by Lang (2006), and provide information on quenching methods, hardnesses (both in the edges and internally) and the mixing of metals to identify regional patterning. Furthermore, Stead (2006) has showed the value of x-raying iron weapons to reveal the original edges, hidden components of the weapon and possible engraving or stamping; a more wide-ranging programme, that included spears as well, could provide a much-needed boost to the quantity of information currently available for analysis.

Chapter 8: The Development of Warfare as an Activity and as a Concept

In considering the changing nature of warfare in northern Britain evidenced by metal weapons, a crucial topic not previously explicitly discussed are the individuals that wielded those weapons. This chapter seeks to illuminate the identity of 'the warrior', usually a shadowy figure constructed of myth and assumption, and challenge some of the stereotypes surrounding the general concept, particularly in terms of their gender, status within the community, and inherent ability to kill as required. That information, in conjunction with content from the previous chapters of this thesis, will be used to present the conception of warfare that has informed this thesis and been developed by it, in the form of a model of the changing social role of warfare and the identity of its participants throughout the LBA, IA and EHP. Such a model will necessarily be relatively simplistic, given its limited evidential source, but will subsequently present an opportunity for the 'elephant in the room' to be addressed – alternative sources of evidence relating to warfare. The firm focus in this thesis has been on metal weaponry, but osteological evidence, site development and textual sources are also crucial to a balanced understanding of the topic, and will be compared with the weapons-based model of warfare in order to assess its validity and place it within the broader understanding of these periods.

8.1 Perceptions and realities of 'The Warrior'

The disjunction between the perception of what warriors 'are', and the more complex range of possibilities occasionally suggested by a range of sources of evidence, is rarely considered. Two key aspects of 'the warrior' of popular imagination are their masculinity and the social desirability of martial prowess.

During the following I hope to demonstrate that neither are an absolute given. Furthermore, consideration is rarely given to the enabling and limiting factors of warriors; they are portrayed as springing fully formed into the world, instead of existing as individuals who might suffer fear and doubt and who must be 'made' into the warrior society requires them to be.

8.1.1 Women in combat

"I shall not go back to the remote annals of antiquity to trace the history of woman; it is sufficient to allow that she has always been either a slave or a despot, and to remark that each of these situations equally retards the progress of reason" (Wollstonecraft, 2004: 60)

Women are often represented in publications, and for public consumption, as domestic/lesser, while men are external/political/better (Pope, 2006), particularly in the field of prehistory. This may partly relate to modern perceptions gendering specific goods, so that females become associated with domestic remains, jewellery and so forth, and males with weapons and markers of external power. The result is a self-perpetuating reflection of modern gender relations onto prehistory. Such ideology is even presented by apparently feminist writers such as Watts (2005: 122), who ascribes various occupations as male (blacksmith, cobbler, copper-smith) or female (launderer, dye-worker, potter) without any supporting evidence. She further explicitly links interests to gender in the same way: men may be interested in "taxation, army movements and government contracts", while women should be more concerned with "the exchange of remedies for illnesses which may have beset them or their children, and information on the latest in fashions and hairstyles or new foods available in the market". Here we see Pope's public/private, better/lesser gendered dichotomy writ large. A further consequence is that women are often written out of prehistory as actors within society, and instead become either a commodity or a class apart – kings, noblemen, freemen, *women*, slaves (Pope, 2006).

The dismissal of women from the public sphere becomes particularly relevant to this topic when the identity of combatants is sought. The majority of writers on the

topic, such as Cunliffe (1995), Kristiansen (2002), Hill (2006) and Harding (2007) implicitly or explicitly assume solely male participation in combat, even where the evidence of gender is ambiguous at best, instead presenting women as the prize of warfare. One such example is that of the 1961 publication on the rock art of Val Camonica in northern Italy by Emmanuel Anati, that states that 60% of the figures have representations of a penis, but only 4% are women (Ehrenburg, 1989: 141). Harding (2007: 138) describes the warriors, depicted at both Val Camonica and at sites in Scandinavia, as "invariably male", but does not elucidate his thinking. Of the warriors in question, some are rampantly phallic and others entirely gender neutral. Other authors go further than simply making unquestioned assumptions, and ignore specific evidence: Redfern (2005: 330) comments that when male skeletons are found with osteological injuries it is common practice to consider such trauma as explicit evidence of involvement in combat, but that equivalent injuries to female skeletons are frequently ignored. There is also the implicit assumption in the majority of skeletal studies that skeletons with wounds or skeletons with weapons are male, but only more recent work provides confirmation through definitive sexing of the remains; data drawn from older studies must therefore be treated more cautiously. Similarly, a trend is visible in some older studies to sex burials by grave goods – Stead (1991b: 127) was concerned about being "over-scrupulous" in placing a skeleton in the 'possibly female' category because although it presented female characteristics, it was buried with a sword and shield. The extent to which analysis is conditioned by the nature of grave goods has considerably lessened since the early 1990s, given a widespread recognition that objects such as jewellery did not always have the same gendered connotations in prehistory as they do in modern society, although the degree to which that recognition extends to weapons is questionable.

Not all researchers follow this pattern, however. Osgood, Monks & Toms (2000: 3) note that care should be taken not to assume that only males were involved in warfare, while Thorpe & Parker-Pearson (2005: 5) explicitly contest the view that violence and war was primarily the business of men, since it ignores ethnographic and historical evidence. Although women are vulnerable to becoming victims of violence during warfare, there are also a number of modern instances of women

becoming involved in political struggles (as in Liberia, particularly during 2003) or, as occurred in Rwanda in 1994, taking a darker role as facilitators/encouragers of conflict, as well as actively participating in the killing itself (Summerfield, 1998: 13). It is also often not the case, contrary to expectation, that only men are responsible for protecting communities (Conkey & Spector, 1984). The World Health Organisation's 2002 report found that women, particularly in domestic contexts, could be active participants (Redfern, 2005: 354). Despite these modern instances, it is only relatively recently that focused research has been undertaken into female involvement in violence (Lorber, 1994; Kelly, 1997; Kimmell, 2004; McClennan, 2005; Peach, 2005), with the various findings that women can be as violent (if not more so) than men, they can meet the physical requirements (and are sometimes stronger) than men, and that mixed sex fighting units perform as effectively (if not more so) than all-male units. Such involvement is likely to occur in a number of ways, ranging from participation by a whole community in response to a particular threat (Adams, 1983), to one of the more extreme explanations suggesting that under certain circumstances women can create a third gender for themselves, borrowing elements of masculinity that enable them to perform 'male' activities. Shepherd (1999: 322-3) suggests that in Norse society, a woman might be forced to take a male role if there is no other male heir or relative, in order that legal proceedings, inheritance and managerial roles are fulfilled. Under such circumstances, the woman in question is usually described as virginal and was not considered a 'proper woman', presumably because, in standing as a man, she could not be treated, or related to, as female. Such practices also tally with ethnographic evidence from the 'sworn virgins' of Albania, who 'become' men when necessity demands it, although such a transformation is permanent; they must remain men, and virgins, for life (Young, 2000). It is interesting that the transformation from girl into 'other' may only occur during a liminal stage in the individual's life – old enough to take on the duties of a man, but (since virginity is emphasised in the associated literature) presumably before that individual has engaged in the adult female behaviours of intercourse, marriage or bearing children.

There are compelling reasons to support women's involvement in some forms of

conflict, if only defensively. Aspects of modern warfare which have been found to be common across all countries include the targeting of children (as a particularly effective means of instilling terror), the targeting of medical staff and patients and the sexual violation of women (Summerfield, 1998: 11-12). Some of these patterns can also be seen in prehistory: in the British IA, Redfern (2005: 332, 336) found that although less women than men have osteological trauma, there is a significant proportion who do (mainly blunt force fractures to the crania), which led her to conclude that women formed a particularly at-risk group or were involved in sporadic violence themselves. Bishop & Knüsel (2005: 211) also found that traditional non-combatants – women and children – appear to have been regularly killed in IA conflicts. It is hard to imagine that, during circumstances when the lives of women and their children were threatened, those women would not take part in any practical defensive measures to save themselves or their dependents.

There is a range of osteological, archaeological and textual evidence supporting the participation of women in warfare, either as aggressors, active defenders or victims, although the osteological evidence for Britain has only been analysed from that perspective by Redfern (2005; 2008a; 2009). In addition to the data above, she also found that the ante- and peri-mortem injuries sustained by both sexes suggest that gender did not restrict an individual from involvement in acts of violence, particularly those involving projectiles – which is especially interesting given the following discussion of the status and perception of aerial weapons. The positioning of the injuries is the same in females as it is in males, indicating that attacker and defender were reacting in similar ways regardless of gender – it is not a case of males receiving wounds in combat while women are cut down from behind as they run away (Redfern, 2005: 332). Further, from the proportions of healed and unhealed injuries, she notes that these episodes of violence frequently occurred several times within the lifetime of an individual (Redfern, 2009: 415).

There is further archaeological evidence (from Britain and elsewhere) to support the concept of female warriors. Around 20% of the Scythian-Sarmatian warrior graves found on the lower Don and lower Volga contained females dressed the same way as males and buried with swords, daggers, arrowheads and saddles

(Anthony, 2007: 329). In addition, an IA cemetery in southern Siberia shows substantial evidence of numerous female combatants, the trauma patterns showing similarities with those identified in the Dorset sample (Redfern, 2005: 347), while Hunter (2005: 47) notes that female warriors are regularly depicted iconographically in Gaul. Finally, the Roos Carr figurines have often been considered male, since all 5 figures have pubic holes drilled into the body which were assumed to have held penises. However, the sex of many similar carvings is ambiguous and such holes could have been intended as a vagina, to represent intercourse or the birth process (both of which are connected to the social symbolism of warfare, as discussed below) (Coles, 1990: 331). It is possible that the figurines could have functioned as either gender, depending on context.

Finally, there is a range of textual evidence from the RIA onwards explicitly describing female empowerment, leadership and violence taking place in Britain and the Continent. Tacitus occasionally writes intriguing vignettes regarding female roles and status: some German tribes were said to have had female rulers and hunters (Ehrenburg, 1989: 155-6) while the defenders of Mona apparently included women “with dishevelled hair like Furies, brandishing torches” (Cunliffe, 1991: 205). Other sources are more explicit; some suggest that Continental IA women were almost always present on the battlefield, the females of the Ambrones tribe are said on one occasion to have killed both Romans and their own men on the battlefield (the latter as traitors after they fled the battle) (Ehrenburg, 1989: 164; Osgood, 1998: 84), while Paulinus exhorted his men not to fear a horde of fanatical women on Mona, or to be put off that there were more women than men in Boudicca's army (Cunliffe, 1991: 205). Female leaders were not unknown, in particular Boudicca (and potentially her daughters, who were intended to inherit) and Cartimandua, but also another female Brigantian leader, mentioned in Tacitus' description of Calgacus' speech, who is said to have attacked a Roman colony and camp (Ehrenburg, 1989: 167). These references may enthuse a modern feminist audience, but in context they are unreliable; such vignettes were probably intended as a caricature of the nature of 'barbarians', the participation of females in warfare evidence of an alien nature to a Roman audience for whom female fighters were unnatural. It is possible that they contain an element of truth,

and that during the IA, in Britain and on the Continent, women could be leaders in, and warriors for, their communities, but such textual evidence should not be taken at face value.

Textual sources of the EHP and beyond indicate a considerably more limited public role for women. The *Táin*, which in this instance is likely to have portrayed EHP attitudes more than IA reality, describes the involvement of women in combat as unnatural; this suggests that it may not have been widespread or accepted, but that it did happen occasionally. Although two female warriors from Scotland are mentioned by name (Scáthach and Aife) (Kinsella, 2002: 31, 32), as one might expect from a text created in the early Christian period the sense of the work is deeply misogynistic in the way it portrays women and their actions in public life. Other EHP texts and iconographic representations indicate warfare was an entirely androcentric activity, although it is textual evidence that provides the occasional exception to the rule. Ethelfleda ruled Mercia for 8 years, from AD 911 to 918, after the death of her husband, was dubbed the Lady of the Mercians, and engaged in military expeditions to Wales, as well as capturing the strongholds of Derby and Leicester (King, 1902: 177). Thus, during the EHP women are presented as normatively engaging only in the private sphere and were apparently not welcome in the male-dominated arena of warfare, although occasionally circumstance could enable their presence.

Despite a range of evidential sources which *could* suggest a normative role for women in combat, much of the evidence is ambiguous and it would be disingenuous to overlook a significant amount of evidence pointing to a majority of male combatants. With the numismatic evidence, where the die was accomplished and the coin is unworn it is possible to identify many details, including gender, since many warriors were depicted naked on coins. All recognisable representations on British IA coins are male, bar one naked female carrying a carnyx (but no other weapons) (Hunter, 2005: 46). There are a huge number of phallic references in warfare, from the Iberian and Scandinavian rock art, to several of the wooden figurines found around Britain, to the chalk figurines found in Yorkshire. Of all these iconographic representations, none appear to link

female and warrior characteristics. Meanwhile, the majority of textual evidence implicitly indicates male fighting forces as the norm. The latter aside, however, the connection between male representation of warriors and all warriors being males is rather simplistic, given the ritualistic and religious associations between the phallus, weapons, nakedness and the sacred (see chapter 7). Furthermore, even where burial and iconographic evidence are profoundly biased towards masculinity, Hunter (2005: 43, 50) notes that burials and coinage are expressions of self or group identity. They are not necessarily a reflection of reality; although women might have participated in combat, neither they nor their male counterparts necessarily identified them with the warrior image. Using a modern analogy, although modern social media portray DIY as a solely male activity and cooking/cleaning as a solely female one, in reality there is considerable gendered cross-over. Therefore, iconographic and burial representation may be misleading.

In conclusion, it is not the intention here to construct a feminist ideal of prehistory by suggesting that gender relations in the LBA and IA were a utopia in equality, in which men and women participated equally in all arenas of life. The evidence simply does not support such an interpretation. However, it is poor practice to make assumptions based purely on modern gender prejudices. The results of the above synthesis of evidential sources suggest a rather more complex picture than simply 'warrior equals man'. Women appear not to have participated in warfare and conflict in equal numbers with men, nor were they identified (by themselves or society) with the 'warrior ethos'. However, the evidence, particularly from the IA, suggests that there were occasions when women were actively involved in fighting over the course of their lifetime; these occasions were not isolated, unique incidents as they occurred repeatedly in some individuals, and similarities in trauma patterns between genders do not suggest identifiable differences in behaviour between males and females. It is therefore perfectly possible that women were acting as aggressors, as well as defenders or victims. Certainly the analysis of weapon and grip length in Chapter 7 suggests that a proportion of both LBA and IA swords could certainly have been wielded by women. Unlike later periods, such activity in the IA and possibly earlier appears not to have been considered abnormal, simply perhaps in the minority.

8.1.2 Heroes or outcasts?

A second assumption frequently made about the 'warrior' persona is that those considered as such were the social apex of their community, accorded considerable status as a result of their skills. A focus on such warriors forms part of what Haselgrove & Pope (2007: 16) describe as the 'grand narrative' of traditional IA studies, although they note that new approaches focus on the domestic, agricultural and routine. The following is an attempt to reconcile these two, understanding how the image of the elite warrior can be reconciled with communities who spent the majority of their time farming and performing the tasks associated with daily living; for once the fighting stops, the warrior cannot simply be put away in a box until next time. How does this individual fit within their society? And how does that society view a person who has been trained to kill, albeit in their service?

Although it is not possible to identify direct evidence in answer to such questions, one might examine aspects of material culture as proxies for groups, such as considering the degree of integration of the material culture associated with warfare and the material culture consisting of non-combat items (these including axes, glass, pottery, bone, jewellery etc). By examining when and how these items are or are not found in conjunction with each other, conclusions can be drawn regarding the place of both warriors and the concept of warfare within society. The table below divides the LBA and IA weapons, by percentage, into those found with associations and those that were not, to indicate the general proportions. Those with associated material were then divided by context into burials or hoards (at its simplest, two or more items found in conjunction with each other); ordinarily, contextual analysis in this work includes a 'settlement' column, but in this case, because the focus is on association itself, multiple items found together on definite or potential settlement sites were simply classified as hoards. Stray finds from settlements which had no associations were not relevant to this table. The LBA produced no weapons with associations from the context of a burial. Each contextual column was then subdivided to indicate the relative percentages of those found solely with other combat items, those found solely with non-

combat items and those found with representatives of both.

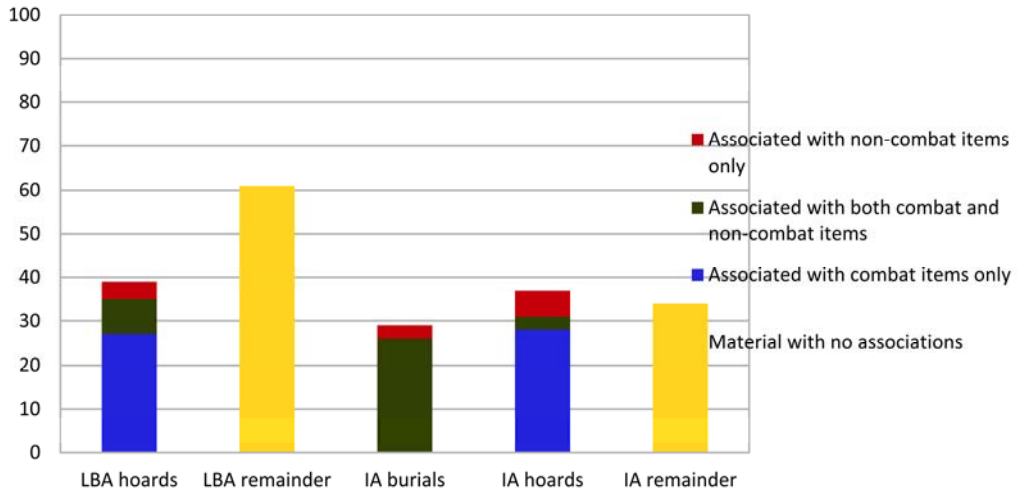

Illustration 41: Associative patterns of the contexts of LBA and IA weapons of northern Britain

It is immediately noticeable that, unlike the hoards, none of the IA burials contained only combat associations. This is at least partially due to these burials normatively including clothing and small possessions in addition to any weapons; even a clothing toggle was included as a non-combat item in the analysis. However, it is clear that only a very small percentage contain only one weapon and non-combat items; further information from the database suggests a number of burials are very weapons-dominated, but some additional items also denote a high level of status for the interred individual, such as carts or horse gear. These items do not appear to reference alternative aspects of life, such as farming or domestic life. The hoard associations of both periods are relatively similar, and both strongly suggest that the majority of hoards containing a weapon consisted purely of weapons, although a proportion included other material. In relation to the original question, and considering additional qualitative information from the database not contained within the graph, it appears that the burials of individuals do not represent an integration of warfare and other aspects of life in the IA. This may be because during the IA the role of a specialised warrior was of more importance to an individual's identity and existence than any other role that person might have occupied. That dominance could suggest a degree of deliberate separation between martial and non-martial individuals in IA life, but the hoard contents indicate that separation did not wholly extend to the concept of warfare.

In both the LBA and IA the presence of non-combat items within more than a quarter of all hoards suggest that, although in the minority, it was not abnormal to integrate the material culture of warfare and other aspects of life into a broader package suitable for deposition. Although warriors as people may possibly have been considered as a group apart, the concept of warfare itself was, to an extent, integrated with other aspects of life, such as sustenance, work and community cohesion.

It has been suggested that since the warrior must take actions outside the norms of accepted intra-group behaviour in order to defend it, they in effect become 'other', and may be shunned (Shepherd, 1999: 219). Such ambivalence may not simply be a reaction to the blurred role of the warrior as defender and aggressor; Shepherd (1999: 219) cites Roman and German sources suggesting that IA warriors supported themselves and 'trained' during peace time by raiding indiscriminately, an activity which would surely encourage rejection of both the individual and the identity. A potential source of evidence for such conjecture is the spatial distinguishing of warrior graves in Britain – around half are either isolated burials or, where they are found in cemeteries, they are clustered together and/or set away from the others (Hunter, 2005: 52). Further research focusing on the dating of such burials may be able to determine whether they are the result of a particular event or cultural practice.

Although the nature and specific activities of warriors may have led to a degree of ambivalence towards them in general, it is highly unlikely that a community would have rejected such individuals in any concrete sense. Firstly, Grossman (2009: 265-6) makes clear the vital importance to warriors of acceptance by their own community if they are to remain mentally stable after taking part in killing. Maintaining warriors was necessary for the safety of the group, so acceptance would also be necessary. Furthermore, there is no evidence that such individuals suffered any practical form of ostracism; indeed, at least during the LBA, LIA and EHP, warriors appear to have been at the wealthy end of the social spectrum and certainly projection of a warrior image seems to have been desirable from the burial, iconographic and textual evidence of the LIA and EHP (see Chapter 7). The

connection between elite status and martial activity is not evident in the EIA, but there is also no evidence for actual ostracism. In order to balance any social tension between the existence of an elite, valued group within society engaging in activities which benefit the group on one side, and the fact that those activities and attitudes would be unacceptable and dangerous in intra-group relations, it may have been necessary to conduct post-conflict cleansing rituals. Furthermore, such rituals may also have benefited the combatants' mental health, providing a psychological framework with which to distance themselves from potentially traumatic actions and experiences – Molloy (2006: 202) notes that even successful soldiers can subsequently develop a range of mental health issues, ranging from Post-Traumatic Stress Disorder to Obsessive Compulsive Disorder. Thus we can potentially explain large-scale ritualistic deposition of weaponry, the ritual 'killing' of both bronze and iron weapons and the existence of spatially separated warrior graves.

8.1.3 Limiting and enabling factors to conflict

As touched on above, and discussed more widely in terms of genetic determination and individual choice in Chapter 2, warriors are not born, but must be made. Grossman (2009: 121) notes considerable reluctance in the majority of individuals who took part in various conflicts during the 20th century to actually kill – particularly where the opponent is only at a sword or spear length distance away. In part this is due to the presence in many modern societies of social authorities which both protect group members, and punish non-sanctioned acts of violence; consequently, group members do not need to protect/avenge themselves and socialisation of children emphasises empathy rather than aggression (Armit, 2011: 499-501). In the absence of regulatory state control, each community needed to develop the means by which to defend themselves – from an early age children needed to be raised as the next generation of warriors (Redfern, 2009: 416; Armit, 2011: 501). How successful they were depended on their training, experience and the particular context of the conflict in which they found themselves.

The limiting factors are mainly physical and psychological. Daly (2002: 166)

states that endurance, morale and concentration in battle will depend on how fresh the participants are (have they had to march a long distance to get to the site of the conflict and have they slept adequately, for example), how well they have recently eaten and the weight of their equipment. Once combat starts psychological factors, such as stress and fear, will limit fighting ability since physical symptoms of such stress include a pounding of the heart, trembling, sweating, weakness, stiffness, vomiting, compromised vision and double incontinence (Molloy, 2006: 205-7)). Recalling elements of training and performing adequately under such debilitating pressure is enormously difficult. Such fears could be exploited by the opposing side; Cunliffe (1991: 120) and Daly (2002: 171) both discuss the use of battle horns (carnyces) as a psychological weapon. Carnyces are relatively common on Continental iconography, but are rarely found in the archaeological record – although one such was found at Deskford, in Banffshire (Hunter, 1997: 121; Hunter, 2001: 90-93).

These limitations can be countered by the context of a conflict, and social support or pressures. Conflicts involving emotional and practical motivations, such as blood feuds or an immediate struggle for survival, may exert a stronger psychological effect than those discussed above. Regardless of social context, during the fighting itself Daly (2002: 200) suggests that good leadership, fear of social stigmas or punishment for cowardice, and the hope of plunder might overcome natural psychological mechanisms from entirely limiting performance. Furthermore, the ritualised aspect of warfare discussed in Chapter 7 (which is not to suggest it was not also brutal and deadly) may have been developed to provide a mental framework within which warriors could present the behaviours expected of them. The use of carnyces and other noise-making, strict rules of engagement and elements of display may all have assisted mentally in preparing for large battles, although it is doubtful they would have applied or been of help in smaller-scale conflicts and raids. The period just prior to conflict can be used to mentally prepare participants for battle, using 'moral disengagement', 'magic' and ritual, or drugs and alcohol. 'Moral disengagement' involves the aggressors dehumanising or objectifying their opponents, making them less worthy of empathy and therefore easier targets of violence (Armit, 2011: 502), while the use of 'magic' or

ritual may allow an individual to rid themselves of unwanted emotion, such as doubt, fear or empathy, for a short period. Both Creighton (1995: 295) and Thorpe & Parker-Pearson (2005: 5) note that external stimuli, such as drugs and alcohol, can make almost any person capable of extreme violence, and Creighton states that the use of narcotics in Britain has been known of since the Neolithic. Finally, one of the best ways in which a person can overcome situational stressors in order to perform a task appropriately is to ensure that they are drilled in that task repeatedly, such that it remains in the 'muscle memory' when all conscious thought is gone. Indeed, Redfern (2009: 416) determined that the presence of adolescents presenting cranial trauma in Dorset, the inclusion of projectiles in adolescent graves, the generally young age of those killed in combat and the need for repetitive martial training to allow fighters to accurately aim slingshots at other people suggest that training for war began at a young, even pre-adolescent, age during the IA. The same is almost certainly true in other periods in which warriors were drawn from elite sections of the population and were afforded sufficient time to train to become specialised. During the EIA, this does not appear to be the case and combatants were more likely to have been pastoralists engaging in occasional violent episodes. Consequently, such violence is likely to have been more chaotic and traumatic for the individuals involved – although not necessarily less dangerous, since greater fear and less control may make a desperate individual more dangerous.

8.2 A proposed model for northern British warfare based on weaponry

The following model is intended to convey the varying forms in which evidence of warfare is presented in the archaeological record of northern Britain; drawing on the evidence and issues discussed in the preceding chapters, it is particularly concerned with the social motivations for conflict and the way that will influence both the form of the conflict itself and the evidence that remains. Consequently, it is possible to identify distinct differences throughout the periods under discussion and consider specific similarities and differences in practice across time. However, as a model there is always the likelihood of exceptions to the rule, and cannot be

used as a constantly accurate predictor of human behaviour.

8.2.1 Social motivations of warfare

When conflict occurs between groups, one is usually the primary aggressor, casting the other in the role of defender. For the latter party, a key motivation in the ensuing conflict is always defence, but motivations for the former can vary substantially. Two of the most important points regarding such motivation were made in Chapter 2 – that conflict will take place under "specific, culturally prescribed circumstances" (Carman, 1997a: 3) and that it will take place when it is of material benefit to the participants to do so (Thorpe & Parker-Pearson, 2005: 5). The question that thus arises is, what precisely are those cultural circumstances, how might they change, and what form will the material benefit take? Of the plethora of motivations suggested for warfare, although the form in which social status is held and expressed is crucial to what evidence is left in the archaeological record, a key one more visible than others archaeologically-speaking is economics, which manifests in one of two ways.

The first economic motivation is the desire for territorial expansion; the material benefit is long term access to a range of resources, but it also requires particular social circumstances to be in place. The aggressor must not only possess sufficient military strength to overcome the defender, but they must also have the capacity to continue to hold the new territory, the cultural will to do so and the social systems in place that allows power to be retained by the group after a particular leader has died. It is for these reasons that Armit (1997: 48) considers territorial expansion to be characteristic of states, rather than tribal societies. Where this occurs, the necessity of a strong individual in a leadership position, a group of combatants to do the fighting and maintain any subsequent 'peace' and the wealth that accrues from their martial activities, suggests that the leader and those who are good at fighting are likely to gain considerable wealth and status on an individual basis. It is therefore in their own interests to in turn project a warrior image. Consequently, societies involved in territorial expansion are highly likely to be represented by a record that denotes a preoccupation with conflict and martial success.

The second manifestation of economic benefit is short-term gain, where the successful group will take resources only once from those they defeat, rather than remaining to exploit those resources over a longer time period. This is probably the most widespread and least complex motivation for warfare, given Thorpe & Parker-Pearson's (2005: 5) assertion that economic benefit underpins all conflict, and yet economic-based raiding requires none of the social constructs in place that are necessary for territorial expansion. At its most basic level, this form of conflict is not far removed from one individual robbing another, and therefore only requires that one group possess resources in some form that are desirable to a stronger group. Given that resource redistribution is able to take a number of forms, and specific social/cultural concepts and constructs are unnecessary for this motivation to cause conflict, it is the hardest motivation to find direct evidence for in the archaeological record.

However, where the economic motivator is short-term rather than territorial based, the focus of statements of status will determine which of two distinct forms of conflict will be presented. Periods when status appears invested within the community as a whole are characterised by monumental building construction and limited quantities of high quality, prestigious, elaborate or exotic goods. It has even been suggested that during such periods what high status goods there were, were worn by individuals who represented their community, the trappings of wealth therefore denoting the group rather than the individual (Hill, 2006: 176). During such periods, weapons are unlikely to be elaborate in any way or deposited in a particularly significant manner, because such items are functional tools associated with one individual's activities. Where construction of status and identity are not focused upon that individual, there is no need for such elaboration. Likewise, any iconography or textual evidence relating to such a period is unlikely to reference warriors and warfare, for the same reasons. Thus, short-term economic drivers operating contemporarily with community-centred statements of identity will result in an archaeological record almost devoid of obvious evidence for warfare.

That picture is altered when statements of status focus on the individual. Cultural

investment of status within the individual forces group members to outwardly display their place (or desired place) in society through their own personal adornment and possessions. Under such circumstances, elaboration and specialisation of weapons flourishes, and those who bear them are most likely to fulfil a specialist role also, spending considerable time becoming proficient in their use. The result is both a specialist role of warrior, and a concomitant ethos of martial prowess and ideals which informs both identity creation and social standing. Therefore, for similar reasons to those discussed in relation to territorial expansion, societies in which the economic motivator for warfare is short-term, but social status is achieved by individuals, are likely to be indicated by a record replete with elaborate weaponry and, where relevant, martial imagery and texts focusing on warlike activity. Furthermore, the quest for achievement, and continuation, of status for the individual may itself be a motivation to manufacture conflict, with its resulting opportunities for displays of wealth, prowess and wider social acceptance.

8.2.2 Warfare during the periods under discussion

By considering the periods relevant to this thesis in light of the social constructs and economic motivations discussed above, it is possible to identify four distinct periods of warfare suggested by the evidence presented in the database.

Assuming that Armit (1997: 48) is correct, neither the LBA or the IA are likely to have been concerned with the long-term economic benefit of territorial expansion, since society during these periods cannot be described as state-like, and is more likely to have operated on short-term economic motivators. The question then revolves around status expression. While excavations have indicated the probability that many of the large hilltop enclosures associated with the EIA were actually begun in some form in the LBA (Sharples, 1991: 14; Armit, 1997: 53; Armit, 1999: 74), those early stages lacked the monumentality of the later hillforts. In addition, the quantity and quality of metalwork from the LBA suggest a significant degree of importance focusing on the individual and their accoutrements. Sharples (1991) has argued that during the LBA conflict took place between individuals because it was individuals who controlled the most important

and valuable things, such as trade and exchange routes. A successful warrior who killed their opponent could also gain their wealth, and individual weapons were crucial to that model of power structure. It is therefore unsurprising that such a high number of personal weapons in the database originate from this period. The high status and symbolic and material value of the weapons (see Chapter 7), and the training required to use them proficiently (see Chapter 4), suggest a form of conflict in the LBA that would involve only a relatively small and elite proportion of the population, possibly of both sexes, who became specialised warriors. Meanwhile, the status and short-term economic motivators indicate that such conflicts are likely to have taken place either at the boundaries of territory, where the 'theatre' of conflict could take place in a relatively neutral space accessible by both groups, or at the locations where the resources that attracted the aggressors were to be found. For this reason, the question of whether conflict occurred at settlements probably depends on the resources that might be found there. Portable metalwork, agricultural surplus and slaves could all have been considered legitimate targets of raiding, although ethnographic and textual records (Huntingford, 1934; Kinsella, 2002) suggest a high degree of importance placed on domestic animals such as cattle as both an important resource and symbol of wealth – their very mobility making them an ideal target of raids.

The social upheaval at the end of the LBA (see chapter 1) clearly led to some significant cultural changes. Immediately after the collapse of the social system based on bronze, the dispersed communities of the LBA began to coalesce into larger groups, whose wealth and power was associated with direct control over land and production (Sharples, 1991: 84; Bradley, 1997: 69; Armit, 1999: 75). However, deposition, and possibly also production, of metal objects during this period became extremely rare indeed; there are no iron weapons from northern Britain that have been securely dated as earlier than 200 BC. The lack of weapons associated with this period has traditionally led to a pacification of EIA and MIA society, with an assumption that the inhabitants of northern Britain at this time were a peaceful society of egalitarian farmers (James, 2007: 160-161). While it is true that warfare no longer appears to be an arena of social competition and identity creation through the medium of weapons (Armit, 2003; Hunter,

forthcoming), there is little reason to suppose that there was not continuing, sporadic (and equally brutal) struggles for the control of land and production. Indeed, James (2007: 163) notes that comparative approaches suggest that we should not necessarily expect to find a lot of direct evidence for violence, even though it may have been socially significant and frequent. In addition, he suggests that since all forms of metalwork, and not just weapons, have reduced visibility during the EIA, the numbers of weapons in the record are not necessarily an accurate reflection of their levels of circulation and use.

Assuming a continuing level of conflict, the question of status expression remains crucial to determining who might take part in conflict, and why. As deposition of metalwork, and therefore also evidence for high status personal items, dwindle sharply, construction of large, highly elaborate enclosures across northern Britain in the EIA has been interpreted as indicating a focus on the status of the community, as opposed to the individual (Hingley, 1990: 96-97; Sharples, 1991: 82; Cunliffe, 1995: 91-92; Pope, 2006). During this period conflict may be occurring over the control of land and production, but as the motivators for warfare change, it is reasonable to suppose that so too will the form in which it is conducted. Where the primary motivation remains short-term economics, with no associated social conception of 'the warrior' or a 'heroic' ethos, conflict is likely to have been more brutal and possibly even more widespread; as rules governing when attacks can be made, who can be attacked, how and so on are less likely to have operated as a social control, social aggression may have come to resemble a 'free-for-all' in the competition for survival and dominance (see section 2.1.1). Territorial boundaries are therefore less likely to have provided the locale for such conflict, but the location of particular resources will remain important. The identity of the participants can also be expected to change, in that the absence of valuable weapons and evident martial hierarchies suggest combatants could be non-specialised and drawn from almost any strata of, or group within, society; rather than rules governing who was eligible to fight, immediate necessity and capability would have governed such activity.

This form of conflict did not last throughout the IA, however. Around 200BC,

extensive production and deposition of metalwork began again, the depositional context and form of the weapons in particular suggesting that these were items of particular personal, social and symbolic importance (see Chapter 7). Once again, status appears vested with the individual and the concept and status of the warrior in particular become socially important. Consequently, the probable locale and eligible participants will return to the parameters proposed for the LBA.

Finally, the lack of EHP weapons in the database make it difficult to draw conclusions regarding the motivation for, and practice of warfare. However, the iconography developing during this period (mainly from eastern Scotland) suggests a socially stratified society, the highest echelons of which were individualistic and concerned with presenting male individuals in a martial light (see Chapter 6). While specialised warrior roles were still deeply important, that role was as dependent on birth and social standing as it was on individual skill (Fraser, 2009: 54, 203, 265), which will have added further elements to the way warriors were perceived by themselves and others. What sets the EHP apart from the LBA and LIA is that during this period proto-state formation begins and increasing power and centralisation is seen throughout the first millennium AD (Fraser, 2009). Therefore, this is the first period in which there is the likelihood of territorial expansion as a motive, and this is strongly suggested by surviving textual records (see section 8.4). Where territorial expansion is the primary motivation for warfare, such conflicts may either be sited in border areas or focus on sites of social power. The numbers involved will be significantly greater than occasions when short-term economics are the motivator, and consequently there is likely to be a greater degree of social difference between individuals fighting within the same group, the latter point supported by the iconography. One other difference the iconography – and textual evidence – suggests between the EHP and earlier periods is that the likelihood of female aggressors taking part in conflict activity is significantly reduced. During that period all representations of warriors are male, and although there are recorded instances of females in Anglo-Saxon kingdoms in southern Britain taking on those roles under particular circumstances (King, 1902: 177; Shepherd, 1999: 322-3), none are recorded in northern Britain.

It is clear from the weapons evidence that questions of motivation and status are key to understanding warfare in northern Britain, and also that forms of warfare developed and changed significantly over the periods under discussion. During the LBA, LIA and EHP an ethos of elite warrior-hood existed, and the projection of that image was desirable, exclusive and socially acceptable. Motivations for conflict may have become more varied during the latter period (or simply more visible), but otherwise a cultural veneration of militaristic activity, objects and individuals remains a common thread. In contrast, within the period between 750 and 200 BC, weapons do not appear to be culturally associated with elitism, and possibly individualism in the arena of conflict was frowned upon, but that does not indicate that conflict itself did not occur. Finally, it is worth noting that the model suggested here is a very blunt tool – the discussion of the relative use and status of bronze and iron weapons in Chapter 7 indicate that there will be further variations and similarities between the periods, which are considerably more difficult to discern.

8.2.3 Problems with the model

There are a number of issues which place limitations on the usefulness of the model outlined above. The first is that it relies heavily on an economics-based interpretation of motivation, and has no flexibility to deal with alternative motivations should they arise. These can be based on emotions, such as the cycle of revenge attacks described by Armit (2011: 501), relate to religious ideologies (Armit et. al., 2007: 2) or cast such conflict as an effective substitute for an evolved justice system, the damage caused to the opposing side constituting vengeance and the economic benefits considered compensation. Elements of these motivations, in addition to the economic and status-based motivations detailed above, would go some way to explaining the endemic nature of conflict suggested during all the periods under discussion. In a more generalised explanation, Armit (2011: 505) argues that warfare and conflict flourish under conditions of general fear and uncertainty. Unfortunately, although monocausal determinants are overly simplistic, motivations based on emotion or complex social constructions and judgements are very problematic to detect with archaeological data. An exception

may be the sieges at Dunadd and Dundurn, which were said to occur in the same year (Fraser, 2009: 207) and imply the possibility of tit for tat attacks; however, that interpretation is far from firmly reliable and similar evidence speaking to emotional motivations is extremely rare. Furthermore, it is questionable to what extent this type of motivation would affect the form of conflict and evidence left behind, but such investigations are outwith the scope of this work.

Secondly, the model is hampered by a lack of evidence, either partially (the dataset is small compared to southern Britain or the Continent), completely (or certain periods weaponry is almost entirely absent) or as a complementary source. The focus on metal weapons was necessary to keep the topic manageable, although in constructing a model based only on a single source of evidence it is possible only to take the broadest brush approach. Expanding the model to include other forms of evidence, such as are discussed in sections 8.3, 8.4 and 8.5, would enhance the complexity of the model, enable further identification of similarities and differences between the periods, and possibly enable regional patterning to be identified – an aspect of analysis that has sadly not proved possible with the available evidence here.

Increasing the complexity may also serve to ameliorate another problem relating to analysis of the EHP. Although polities of this period were capable of territorial expansion, and texts indicate that this did indeed happen, both texts and common sense suggest that conflict was not solely driven by that, or any other single, motivation. Short-term economic motivations such as raiding were highly likely to have taken place on a regular basis, leading to variations in how such conflicts were conducted and, importantly, become visible in the record. It is to be hoped that a more nuanced model would not only be able to distinguish between the two, but also identify such variations in other periods.

Finally, the model itself relies on an assumption that underpins this thesis itself – that conflict is essentially endemic in human society and will occur at varying levels, and in various forms, in almost all circumstances. Such a perspective is supported both by ethnographic and historical sources, and also concurs within

mainstream anthropological thought (see Chapter 2). This is the reason for assuming some level of warfare, even during those periods where weapons are absent; although that assumption should inevitably lead to questions of precisely how there can be conflict without weapons. The answer lies in thinking more broadly about what constitutes a weapon, since there is a danger of making implicit assumptions that all weapons will be manufactured from the dominant/most effective material at any given time. On the contrary, finds from northern British sites provide a degree of evidence for a range of other weapons.

There is the possibility of indirect weapons, such as suitably trained dogs, being used in combat in Britain, as the Gauls were said to do (Barnetson, 1982: 105). The remains of "medium"-sized dogs were identified at Broxmouth, one of whom had died after being struck on the muzzle with a blunt instrument (Barnetson, 1982: 104). However, there are also weapons of a more expected form, but not manufactured in metal. Bone spearheads are found in a range of contexts across Britain and the Continent, some of the earliest of this type being found in the BA in Britain and persisting in Denmark until the Roman period (Olsen, 2003: 102). In northern Britain such weapons have been found at Broxmouth, Ghegan Rock, Borness Cave, Lochlee, Grimthorpe, and further examples are said to come from across lowland and Atlantic Scotland (Stead, 1979: 86; Olsen, 2003: 102; Hunter et. al., forthcoming). Many were originally identified as items like 'gouges', but parallels with objects from other areas, tip damage, design, wear traces and context have led the excavators of Fiskerton and Bac Mhic Connain to interpret them as weapons (Hallén, 1994: 207; Olsen, 2003: 21, 108, 111). Although bone weapons may suffer a degree of functional disadvantage when used in combat against metal examples, in that should bone and metal weapons meet it will be the bone weapon which sustains catastrophic damage, the issue is less likely to arise if weapons were routinely not made of metal during the EIA. It is worth noting, however, that such weapons were not manufactured from bone due to an inability to work metal, as some sites at which bone spearheads were found, such as Foshigarry and Bac Mhic Connain, also show evidence of metalworking (Hallén, 1994: 227). Further, occasionally bone and iron spearheads are discovered together in contemporary deposits, as occurred in the east Yorkshire spear burials

and Danish bog deposits (although both of these sites date to the LIA) (Hallén, 1994: 207).

Essentially, the primary issue with the model proposed above is that it lacks complexity and nuance, which is an inevitable function of basing a social model on a limited range of data. Brief summaries are presented below of the most relevant forms of additional data to allow a measure of testing of the model, and in some cases suggesting strategies through which it might be elaborated.

8.3 Osteological evidence and warfare

The sources of evidence for osteological trauma will have a significant effect on how that evidence is analysed. Knüsel (2005: 49) notes that publications concerned with osteological evidence are usually site-specific or cover a range of contemporary sites within a bounded area. Studies at population-level, particularly where they look at changes over time and could provide insight into the occurrence, intensity and frequency of warfare, are rare. Furthermore, adequate catalogues of existing skeletal material are frequently lacking. Consequently, the following osteological indications of warfare are drawn from a very small number of either individual references to burials or analysis of single, large-scale cemeteries. This state of affairs constrains analysis in two ways: the evidence is very sparse, and hard to employ in meaningful interpretation since since it is not presented "in a directly comparable fashion across period and geographical boundaries" (Armit et. al., 2007: 7).

There are no known LBA or EIA skeletal remains from northern Britain that show weapons trauma, but subtle traces of conflict trauma require examination of skeletal evidence with that specifically in mind, while preservation and identification of such remains is highly dependent on funerary treatments, soil types, location and so on (Armit, 2011: 506, 511). Therefore the lack of evidence does not denote a lack of violence during these periods, particularly as BA skeletons from elsewhere in Britain show evidence of conflict trauma (Osgood, 2005). Currently, there is simply no useful osteological evidence for analysis in the LBA or EIA. This is particularly unfortunate, since LBA and EIA weapons

were made of bronze and bone which might have created different patterns of conflict trauma on bone to that caused by iron weapons. Therefore, extrapolating LIA and EHP osteological evidence to the earlier periods cannot be considered without further work testing the effect of weapon material on trauma degree and form. In addition, had there been evidence from earlier periods with which to compare the later evidence it might have been possible to identify chronological trends in trauma location and form. During the IA and EHP there is a little more data, although its analysis problematic. For instance, it is not possible to describe the relative percentages of the skeletal population exhibiting conflict trauma as the evidence either comes from stray burials, or cemeteries whose population analysis often indicates selective burial, as in the IA cemeteries of East Yorkshire and the EHP cemeteries at Whithorn (Stead, 1991b: 127; Hill, 1997: 553). In addition, a significant proportion of the EHP cemetery burials were of such poor condition that only 4% of those at Whithorn, 47% of those at Hallow Hill and 40% of those at Thornybank could be analysed (Hill, 1997: 552; Proudfoot, 1996: 399, 425; Rees, 2002: 329, 339). A secondary problem lies in how 'trauma' data is collected. None of the publications discussing the northern British material contained the necessary level of analytical detail in describing trauma discussed in Chapter 1. Therefore, it was not possible to determine whether 'fractures' mentioned in osteological reports were accidental or the result of conflict. Consequently, only those skeletons evidencing severe skull fractures and sharp force trauma have been considered to represent conflict trauma. The combined effect of both these problems is to make skeletal trauma appear extremely rare during the IA and EHP, and that must be taken into account when considering the evidence below.

The evidence for skeletal trauma in the IA all dates to the LIA, and comes from the small area of east Yorkshire that comprises region 6; the information is listed in Table 21 in Chapter 7. The sourcing of data from only one area is particularly unfortunate given the finding of King (2009: 165) that there may be considerable variation across Britain in terms of quantity and form of conflict trauma. The quantity of data is extremely limited, but can be compared to the model of IA warfare discussed in section 8.2. Only 9 individuals exhibited trauma from a total buried population across east Yorkshire of 246 adult individuals (Stead, 1991b:

126). This minority of the population might be expected if only the small, elite proportion of society participated in conflicts. However, in addition to the problems with identifying the relative proportion of skeletons showing trauma (see section 1.4), discrepancies between published works detailing the same material should signal caution when considering numbers (see section 7.3.2). The table shows a majority of unsexed individuals, with two certain males and two certain females. Both females suffered sharp force trauma from an opponent facing them, rather than in the back, suggesting a possibility of those females actively defending themselves – or possibly acting as aggressors themselves. The site of burial might illuminate the locale of actual fighting, but all of these individuals were interred in established cemeteries. This could suggest that they were in the defending group and killed close to home, or that they survived encounters elsewhere, at least long enough to return to their own community. Unfortunately, the information available does not indicate whether healing took place on any of the trauma, and in only two cases explicitly described the injury as fatal (although in the two further cases in which the spearhead remains in the body one might assume fatality as a consequence, unless they represent the sort of post-mortem spearing suggested by Stead [1991b: 136-137]). Ultimately, although none of the evidence presented here contradicts the proposed model for LIA warfare, it also cannot be said to support or develop it significantly. It is to be hoped that more data and detail will result from the re-evaluation of the east Yorkshire burial evidence currently in progress (King, 2009: 165).

The EHP skeletal evidence is more complex, in that it is sourced from both a large-scale synthesis and a range of more detailed excavation reports. Furthermore, there appear to be distinct regional differences in the evidence. The large-scale synthesis is Roberts & Cox's (2003) survey of all available skeletal evidence from Britain that dates from AD 250 to 1000. Of the 1700 'bodies' studied, only 43 (2%) individuals showed evidence of conflict injury. Of those, 87% were male and 13% female. No detail is included in terms of the type or location of injury, proportion of healing taking place, context of the skeletal remains or the proportion of the evidence deriving from northern Britain. Without these it is not possible to place this information meaningfully within the model for warfare, other than as an

indicator for percentages of trauma evident in a mainly Anglo-Saxon population.

The smaller scale excavations tend to yield a greater level of detail regarding the trauma. The following is a list of the instances of recorded trauma from northern Britain:

- Walkington Wold, Region 6: 23 individuals (2 complete, 10 without crania and 11 disarticulated crania) cut into a BA barrow; generally considered to be an Anglo-Saxon execution cemetery (Buckberry & Hadley, 2007: 309)
- West Heslerton, Region 6: three adults (one female, two male) presenting cranial injuries (Anderson, 1996: 13-14)
- Addingham, Region 5: female adult with unhealed cranial sword cuts (Boylston, 2000: 369)
- Ailcey Hill, Region 6: unsexed and unaged individual with two unhealed sword cuts to the right frontal and parietal bones (Boylston, 2000: 369)
- Hallow Hill, Region 2: male adult, fatal skull fractures from a blow to the right side of the face (Proudfoot, 1996: 430)
- Hallow Hill, Region 2: adult female, severe blow to left side of the skull which had only partially healed at the time of death (Proudfoot, 1996: 430)
- Hallow Hill, Region 2: unsexed and unaged individual with probably fatal skull fractures (Proudfoot, 1996: 430)

The cemeteries at Whithorn and Thornybank, although containing 118 and 111 burials respectively, showed no evidence of conflict trauma (Hill, 1997; Rees, 2002), although a number of individuals with fractures were found at each. However, the selective burial occurring at Whithorn and poor preservation at both might account for this. The main problem with this summary of evidence is again the regional imbalance. All of the evidence presented here originated either in the Anglian areas of northern Britain or from one Pictish cemetery, suggesting an unrepresentative sample similar to that from the LIA. In addition, the volume of data is too small to make a meaningful analysis, although attempts to compare the data with the weapons-based model of warfare can be made.

While unsexed skeletons still constitute the majority, there is an equal representation of male and female skeletons showing trauma. The EHP is the first

period in which warfare as a male-only pursuit is made explicitly clear, so it is perhaps surprising to find females exhibiting conflict trauma. However, there are explanations for their presence; one has a skull fracture which might arise from interpersonal violence rather than conflict. The other two females suffered sharp force trauma, but there is insufficient detail to know where that trauma lay – if it was to the back of the skull it might indicate the female was trying to flee as she was injured. Further data regarding the findspot and degree of healing (if any) is required to sustain any detailed interpretation.

During such periods of territorial expansion, when participant numbers might be expected to be high and casualties more numerous (given that defeat of the opposing side must under those circumstances be physically accomplished, rather than addressed through display, posturing and ritualistic 'theatre'), one might expect to find either cemeteries with a larger than normal group of contemporary burials evidencing trauma, or mass graves, such as that of the 51 decapitated males of Scandinavian origin, dating to the 10th century AD and found in Dorset (BBC News, 12/03/2010). Unfortunately, no such evidence has yet been discovered in northern Britain. Therefore, as with the LIA, the osteological evidence of the EHP can neither support nor undermine the weapons-based model of warfare; osteology can provide direct evidence of some violence occurring in two periods, suffered by both males and females, and frequently to the head, but more than that cannot, at present, be said.

8.4 Site evidence and warfare

Evidence from enclosed sites are of interest here, as these sites have the *potential* for not only a defensive function, but also a defensive intent during their construction. Only in recent years has evidence of large LBA enclosed settlements begun to emerge, often as the earliest stages of such IA sites as Traprain Law, but as yet the evidence is hard to synthesise. Consequently, it is not currently possible to illuminate LBA conflict practices using site evidence; however, a range of sites developed during the IA and EHP that deserve more consideration.

The EIA saw the development of enclosures which superficially appear primarily

military in function. These have long been termed 'hillforts', while the boundaries were described as 'defences'. Although these terms are clearly loaded with military implications, they are the most common descriptions, and the use of the phrase 'hilltop enclosure' seems to force a blindness to the overwhelming military symbolism of the sites (whether they are functional in that capacity or not). The terms 'hillforts' and 'defences' will be used throughout this work, without prejudging any particular function. However, the key question is whether or not the military appearance of so many hillforts is accurate – do these enclosures constitute evidence of warfare, and if so, in what way? The last two decades have seen the theoretical modelling on enclosures evolve substantially, the work on function being particularly relevant here. The most wide-ranging, regional programmes of excavation have taken place in southern Britain (Cunliffe, 1984; Sharples, 1991, Cunliffe, 1995; Lock et. al., 2005; Payne et. al., 2006), with the resultant theoretical modelling and discussion colouring interpretation for much of the country as a whole. To set the northern enclosures in context, it is first necessary to discuss the situation in southern Britain briefly.

Payne et.al. (2006: 162) developed a chronological narrative for the development of hillforts across Wessex in the IA, proposing that the number of hillforts increased substantially during the 6th to 4th centuries BC, followed by a phase of disruption. By the 3rd century BC many hillforts were being abandoned, although some of the larger examples expanded during this period with more elaborate 'defences' put in place, suggesting a level of increasing centralisation and a greater focus on fewer sites. Discussions about the reasons for the increasing enclosure of space and the use of elaborate defences have evolved substantially over the last four decades. By the late 1980s archaeologists began to move away from previous widely-accepted view that such centres were constructed as defensive castles (Armit, 2007: 30); instead, the boundaries were interpreted as indicators of community status, social exclusion, or physical representations of the ritual significance of the settlement boundary (Hingley, 1990: 96; Sharples, 1991: 82; Cunliffe, 1995: 91). Over the following decade this position was refined, and the possibility of sites fulfilling multiple functions at different times became popular (Cunliffe, 1995: 102; Lock et. al., 2005: 145, 150). In addition to the possibilities

of defence, status, social exclusion and symbolic significance, potential functions considered included activity as a focus of ritual deposition for a community (Hill, 1994: 5), agricultural production (Lock et. al., 2005, 150), a site for commodity production (Cunliffe, 1995: 102), and as a method for promoting social cohesion (Lock et. al., 2005: 134) or control (Dunwell & Strachan, 2007: 74).

However, over the last decade the increasingly detailed corpus of excavation and analysis on enclosures has indicated such a level of variation within the group termed 'hillforts' that some began to question whether they constituted a single and distinct class (Haselgrove, 2006: 9). Published work on the potential functions of such structures can no longer generalise about 'hillforts', but must be deliberately context-specific if the work is to have meaning. Furthermore, several researchers have noted the possibility of contemporary hilltop enclosures fulfilling different functions for the same group of people (Lock et. al., 2005: 150-1; Dunwell & Strachan, 2007: 92). Thus, discussions have moved away from oppositional binary approaches, *either* defensive *or* symbolic, *either* social exclusion *or* inclusion, towards a more complex, regional-based position. This implies a greater need for identifying morphological groupings or patterning within the various forms of enclosed settlements, although Cunliffe's (1984) early schema of hilltop enclosures, early hillforts and developed hillforts remain the basic method of classification in the south, while the 'palisaded, univallate, multivallate' model still has adherents in the north (Armit, 1999: 73).

Unfortunately, the development of enclosures in the northern British IA does not entirely match that of the south; instead of progressively complex sites that eventually become abandoned, sites such as Broxmouth and Dryburn Bridge (east Lothian) suggest significant departures from the pattern. Although the enclosures at Broxmouth become increasingly complex, with periodic rebuilding and expansion, there is also evidence for periods of abandonment and decay in between building works, while Dryburn Bridge moves from an enclosed site to an unenclosed one (Armit, 1997: 56-7; Armit, 1999: 70). However, the creation of boundaries (in various forms) in the landscape, enclosures and spatial organisation became increasingly important throughout the IA in some areas, such as east

Yorkshire (Bevan, 1997: 189), and there is an increasing number of hilltop enclosures across Scotland in the early centuries of the IA (Armit, 1997: 46-7). Furthermore, a degree of similarity in approach and interpretation of the northern and southern sites appears beneficial – publications on hillforts in Oxfordshire and the Caterthun forts in Perthshire both suggest the forts in a given area fulfilled a range of practical and esoteric functions for the same group of people (Lock et. al. 2005: 150-1; Dunwell & Strachan, 2007: 92). In this case, clearly one size does not fit all, and particular roles will also have changed over time and space (Armit, 1999: 74). Northern Britain is in need of regionally-developed frameworks, independent of undue influence from the southern development, addressing the chronology of its enclosures, their role and their place in inter-group relations, before further significant progress can be made on interpreting these structures. Unfortunately, a key factor hampering such analysis is the small number that have been adequately excavated (Armit, 1997: 50; Payne et. al., 2006: vii).

The preceding discussion, while necessarily general and brief, provides a background to the issue of whether these hilltop enclosure sites were practically defensible. Most scholars state or imply that defence could have been one of a range of possible functions for such enclosures, but two distinct factions emerge, one considering defence as the primary consideration, the other focusing on alternative functions. For instance, Sharples (1991: 82) and Cunliffe (1995: 93, 103) considered that the defences were intended to be practically used, particularly in relation to conflicts over agricultural resources, while Hingley (1990: 96) and Hill (1994: 5-6) consider them to be statements of social inclusion/exclusion and status, and loci of ritualistic activity. Ralston (2006) makes a convincing case for considering hillforts on a case by case basis and linking archaeological information with textual records to determine the possibility (and in some cases probability) of a defensive function. One feature that may indicate defensive motivation is the trend noted by Payne et. al. (2006: 154) of blocking one or more entrances (which make the site more vulnerable under attack) during the transition between early and developed hillforts in Wessex. A useful future project would be to determine whether such a practice is also discernible in the north.

In contrast, excavators of a range of IA sites have noted aspects of some enclosures which are hard to explain in military terms. Some are overlooked by higher ground, such as The Chesters (east Lothian), while others, such as Finavon (Angus), appear to have deliberately not made the 'best' use of the topography (Oswald et. al., 2006: 65-7; Dunwell & Strachan, 2007: 89). Furthermore, the scale of the ramparts and enclosing features at sites such as Broxmouth and White Caterthun is out of proportion to the size and interior of the site; the ramparts are very large compared to the internal space, and suggest they were not built for communal defence given that there would not have been enough room inside the enclosure to house the number required to build the ramparts – the construction of just one of the Broxmouth ramparts is believed to have involved the continuous work of a team of 70 individuals (Armit, 1997: 60). Although a defensible location might have been important to those planning such sites, is is possible that if other considerations (perhaps relating to territorial holdings, religious belief or cultural tradition) were of greater importance and required construction in an indefensible location, topographical military advantage might be sacrificed. However, the general contention is that a failure to exploit a potential topographic advantage suggests an unwillingness to use the site for defence. However, Armit (2007) makes a convincing case from ethnographic evidence that the design and use of hillforts is rooted in cultural convention, rather than a modern conception of absolute military efficiency. It is therefore possible that hillforts appearing militarily inept to modern eyes were in fact entirely suited to the forms of warfare which their builders envisaged. In order to determine what these might be, future work should be directed at identifying those sites with the indicators identified by Wileman (2009: 53-54) as archaeological correlates for warfare and then synthesising those correlates with the architectural form of the site to grasp what normative conflict practice might have involved.

This thesis cannot seek to establish whether IA hillforts in northern Britain were or were not used for defensive purposes. The majority may reference forms of architecture which appear defensive to modern conceptions of warfare, but whether they were used or intended as defensive must be considered in the light of regional conflict practices. The model proposed in section 8.2 suggests that status

and identity in the EIA was expressed through enclosure construction, and the enclosures themselves may have become the new focus of conflict. There is too much morphological variation between hillforts to reasonably propose a single motivation for their construction, but the majority of suggested functions are concerned with less destructive forms of social relations. It is therefore more sensible to follow Ralston's (2006) suggestion of studying individual sites with evidence of conflict in order to illuminate the topic, rather than address the sites as a general group.

Hillforts of the northern British EHP have also enjoyed a considerable degree of interest, either in the form of co-ordinated programmes of research, such as Leslie Alcock's series of publications and syntheses (1981; 1986; 1987; 1989a; 1989b; 1990; 2003), or as extensive, detailed publications of particular excavations, such as Lane & Campbell's (2000) volume on Dunadd.

Highly fortified centres may have fulfilled a range of functions during this period, such as status indicators, ceremonial locations, delineators of borders, administrative or economic centres, sites of consumption and distribution and so on, although the evidence is mixed. Only Burghead has direct structural evidence for storage of agricultural surplus, in the form of a wood-lined pit filled with carbonised barley (Ralston, 2004: 37). Remains that may have fulfilled a similar purpose on other sites have left no trace in the archaeological record. Some sites do show evidence of conspicuous consumption, however. For example, South Newbald in Yorkshire yielded 240 metal items in the forms of pins, strap ends, sheet metal, tags, discs, pendants and so on, in addition to a number of coins (Leahy, 2000: 71), while Dunadd and Mote of Mark produced finds of metalwork and other high quality goods (Lane & Campbell, 2000; Laing & Longley, 2006). The existence of a relatively large number of sites with some level of status evident in the material finds, and the lack of a small group of clearly wealthier sites, suggests that these fortified locations retained direct control over comparatively small areas and consequently small scales of resources, but that they were able to retain the wealth from those resources. It is therefore not unreasonable to consider these fortified sites as small-scale economic centres, with

enough wealth to maintain the site and procure some luxury goods, but without the resources or need for large-scale storage of surplus agricultural produce or portable wealth. As in the IA, it is clear that such sites could function as expressions of wealth and power, and also as foci for ritualistic activity: the ostentatious defences (practical or otherwise) at Burghead and the use of iron nails during the construction of both Burghead and Dundurn (Ralston, 2004: 11-12) may be examples of the former, while the rock bowl, footprint, boar and ogham inscription on the summit of Dunadd and the rock seat at Dundurn may represent the latter.

However, such alternative activities did not negate (and may even have encouraged) the possibility of attack and the occasional need for actively functional defences. Excavation reports of EHP hillforts do not record a similar degree of either military ineptitude or rejection of military function as occurs in the IA, with many taking advantage of natural features in the landscape and then supplementing these with a range of man-made defences. Dunadd, Dundurn, Urquhart, Mote of Mark and Dumbarton Rock are all situated on inaccessible rocky outcrops, while other sites such as Burghead, Dunollie and Dunbar make use of sea promontories; the use of ditches, ramparts and palisades similar to the IA examples continued on a range of sites (Perry, 2000; Alcock, 2003). In order to assess the military capability of the sites properly, however, it is necessary to consider their boundaries in more detail, and any textual evidence that relates to them. The 'defences' generally are relatively well-studied (e.g. Alcock, 1981; Gentles, 1993; Ralston, 2004), but entrances and gates – a crucial aspect for functionality – are under-excavated, perhaps as a matter of policy or due to existing damage to the site (Ralston, 2004: 33). Elaborated gates and entrances are what one would expect to see of a defensive site, and are suggestive (though not more than that) of sites with military purposes. In addition, there are extensive and varied references to sieges at fortified sites in various documents – Dunadd, Dundurn, Dunnottar, Dunollie and Bamburgh are all cited as having endured a siege (Fraser, 2009: 160, 207, 214, 246). Archaeological data relating to the fortified sites of the EHP would therefore suggest a capability for military use, as it does in the IA, but it is the textual evidence that confirms such a function

(should that evidence be accepted uncritically).

The weapons-based model of warfare suggests that such sites would become a focus of conflict activity, either as significant sites whose capture promoted territorial expansion or as sites where the possibility of a centralisation of resources made it an attractive target for raiding. Although the former motivation cannot be demonstrated using archaeological data, the latter situation may be visible in the finds from the Mote of Mark, where high-value foreign ceramics and glass were found, in addition to artefacts associated with feasting and horsemanship (Laing & Longley, 2006). The site, a non-ferrous metalwork centre evidencing wealth and status, became increasingly defended, with the construction of ramparts in the late 6th century AD, which were subsequently burnt and demolished deliberately in the latter part of the 7th century (Laing & Longley, 2006: 23). Such activity *may* indicate a connection between the evident wealth of a site and its likelihood of attack, but further examples would need to be established to support a firm interpretation. It is unfortunate that the site evidence for the EHP only supports the weapons-based model of warfare when considered in conjunction with textual evidence.

8.5 Textual evidence and warfare

Texts are the most detailed and immediately rewarding source of evidence in terms of identifying particular practices, motivations and trends in warfare, but their use is also the most problematical. The range of relevant texts, in addition to the generic problems associated with employing them in archaeological research, are thoroughly discussed in Chapter 1, although there are two further issues of particular importance here. Firstly, there is the possibility of considering information derived from texts to be as reliable as archaeological data, drawing on both for analysis although textual *information* may contradict archaeological *evidence*. Secondly, it seems that the more linguistic studies are published on the texts in question, the less we can take as accepted fact. Cessford's (1997) re-evaluation of *Y Gododdin* results in interpretations that occasionally differ considerably from traditionally accepted meanings and interpretations of the text. In particular, he argues that the interpretation of the Anglian involvement in *Y*

Gododdin is the result of later versions and not of properly compelling evidence; although both Deira and Bernicia are mentioned, they are found in the later A-part of the text and thus may not have been part of the original work.

However, momentarily setting such reservations aside, it is worth considering the forms of warfare suggested by textual evidence. These sources are obviously restricted to the LIA and EHP, but the volume of evidence and its form varies considerably between these periods as the identity of the authors and the circumstances behind text creation alter. Regarding warfare practice in the LIA, the majority of textual evidence is in the form of small vignettes regarding British practice or particular events, and lie within Roman works whose primary concern is not warfare, military events or even events in Britain. These sources suggest very large numbers of combatants at particular battles, although the high degree of localised resistance and harrying recorded after the Claudian Roman invasion in AD 43, particularly in Wales, are indicative of raiding techniques (Handford, 1970: 66; Gardner, 1982: 112-113; Grant, 1989: 265, 268). Such numbers would suggest a wide cross-section of society taking part in large-scale territorial battles, rather than smaller groups of purely aristocratic combatants, but that model cannot be considered as evidence of cultural practice in the LIA generally, since the circumstances behind these events were unique. There is no indication, either textually or within the archaeological record, to suggest that the polities within Britain in the LIA ever had occasion to band together in alliances to fight a common enemy other than the Romans. Therefore, neither the supposed size nor societal composition of these conflicts can be interpreted as normative practice. Furthermore, as noted in section 8.2.1, motivation for conflict cannot be derived from these accounts since the British were not the aggressors in these instances. The *Táin* provides a contrasting, indigenous perspective, although its relevance to the LIA is controversial; part of the Ulster cycle of heroic tales, it was created in the EHP but is often thought to depict events in the 1st century AD (Kinsella, 2002) and has been considered a source of information on warfare and conflict in the LIA (Cunliffe, 1986; Hamilton, 1968; Harding, 1979; Jackson, 1964; Pleiner, 1993). Simplistic and generalised ethnographic and material comparisons have since been found to be inaccurate (Mallory, 1981; Mallory, 1986), but Finney

(2006: ix) makes a strong case for using the text as a guide to the social significance and role of weaponry during the IA. Thus, the *Táin* is possibly the best textual evidence to illuminate normative native practices during warfare in the LIA, although the degree of similarity between the picture presented by the *Táin* and the EHP texts (as discussed below) would suggest either a high degree of cultural continuity between the two periods or that the former is not as representative of the LIA as is sometimes thought. The *Táin* indicates a society in which low-level endemic raiding and violence is undertaken by small warbands for whom such is a way of life, particularly in securing wealth and status (Kinsella, 2002; Finney, 2006). However, on occasions (usually at a point when the whole community is threatened or insulted) larger forces can be mustered from among the general population. Interestingly, while individual status is clearly of great importance, access to such status can be achieved through martial means, rather than dynastically or through wealth itself. In this sense, there appears to be a level of egalitarianism evident in society – anyone can become successful and wealthy if they are brave and talented enough – although it is also clear that segments of society existed which wielded considerable power and which were based on dynastic connections or wealth.

During the EHP, Christian writers described the political power struggles taking place in Britain, while lay persons created 'praise poetry' to describe particular events and the deeds of individuals – the majority of which focused on martial activity. The synthesised information from both sources provides a relatively detailed impression of the status associated with fighting and why such conflicts took place. The numbers of individuals involved in any given conflict are instructive in that they suggest the proportion of the population involved in organised violence: unfortunately, the very word 'army' has connotations of size to the modern ear that are hopelessly inaccurate. In context, the law code of Wessex, written at the turn of the 8th century, notes that a group of less than 7 men are thieves, 8-35 men constitute a warband and 36 or more are an army (Evans, 1997: 27): the numbers involved are clearly not generally large. The examination by Aitchison (2003: 23) and Fraser (2009: 349-355) of the (admittedly somewhat unreliable) *Senchus fer nAlban* – a 7th century document that comprises a pseudo-

history of the Scots, dynastic genealogies and civil, military and naval surveys – suggests a maximum military capacity for Region 1 of around 2,000 fighters, while estimates of the capacity of other contemporary polities range between 2,000 and 10,000 combatants (Alcock, 2003: 154-155). Circumstance and population demographics suggest that nothing like this number would have fought in every, or indeed any, conflicts during the EHP; the combatants were more likely to number in the hundreds. Despite the assertions of Alcock (2003) and Fraser (2009) on military strengths, and the contrasting assumption of Evans (1997: 42) that all the organised violence and warfare in the EHP was undertaken solely by a warrior-aristocracy, the truth probably lay somewhere in the middle; circumstance and context dictated which strata of the population would be involved, and how many of them would be fighting. Raiding and other small-scale activities may only have been undertaken by a leader and his closest followers, but the expansionist activities mentioned in Christian records and heroic praise poetry, involving campaigns and sieges, would have required greater numbers than could be drawn solely from the aristocracy. In such cases, mechanisms must have been in place for involvement of a wider cross-section of the population.

The form of a conflict event or period appears to be connected to its motivation, although clearly one type of motivation does not always lead to a particular form. The modes of violence mentioned in the texts include pitched battles, naval battles, sieges, campaigns and raiding (from both land and sea) (Fraser, 2009), the latter appearing to be the most prevalent and driven by a strategy of distinctly short-term economic benefit. Even within this form of conflict there are likely to have been variations, in that the scale of one group stealing their neighbour's cattle would have been considerably different to a specialised warband raiding throughout a region to support itself. The highest strata of society would have particular need of extensive sources of income since their ability to levy, mobilise and reward their supporters, arguably the key to their power, depended on such wealth (Fraser, 2009). Wealth accrued from raiding was likely to have taken the form of highly portable goods, and certainly cattle feature prominently in heroic praise poetry, the 7th century Poem to Cadwallon proclaiming that “wealth of cattle is the portion of those” who followed their lord (Breeze, 2001:149), while Taliesin relates that

Urien took his warband into Gododdin territory for the express purpose of stealing 160 cattle of the same colour (Evans, 1997: 30). Furthermore, Aitchison (2003: 141-142) posits that textual evidence suggests slavery was widespread in northern Britain during the EHP, the Picts in particular being described as both slaves and slavers, although those captured in this way could also be held hostage if they were of sufficient importance to merit political or ransom concessions for their return. Interestingly, since ownership of both cattle and slaves were indicators of status and probably martial success, one might expect iconographic representations of warriors driving herds of cattle and/or slaves before them to represent their triumphs, but this does not occur. Possibly the ethos of the heroic warrior that is presented on the stones does not include the more realistic features of how an individual might have achieved their wealth or maintained their status.

Pitched battles, sieges and campaigns are noted in numerous texts, usually in the context of territorial expansion and related power struggles. Specific sites of battles are hard to identify as the name applied to a particular battle by an annalist may vary or have little or no relation to placenames as they are known today, but the location of sieges (mentioned as frequently as battles in the texts) are usually more easily identified. Sieges have been recorded at Rithe (in 641 and 703), Dun Baitte (680), Dunottar (681 and 694), Dunadd and Dundurn (683), Dun Deauae Dibsi (692), Dumbarton Rock (756 and 870) and Dunaverty (712) (Aitchison, 2003: 102) – most of these are in Southern Pictland or Dal Riata, areas well known to the chroniclers as those that underwent comparatively early Christianisation and were relatively central to their own locations. The descriptions suggest that the Picts and the Scots favoured storming such sites, attempting to breach the defences by burning them and forcing the inhabitants to surrender. Such an approach might also explain why some individuals, such as Iarndodb mac Gartnait in AD 643, are described as having burnt to death (Aitchison, 2003: 100). The motivation to undertake large-scale battles or sieges is often explicitly territorial, as there appears to have been considerable levels of internecine fighting within all the areas of northern Britain over rights to the various crowns, and certain individuals in particular – such as the Pictish king Oengus, the Dal Riatan king Aedan and the Northumbrian king Aethelfrith – were

noted for their aggressive expansionism (Fraser, 2009: 137, 292, 300, 301). Interestingly, however, there were occasions when large-scale conflict appears to have been intended to *maintain* status quo and strategic advantage under particular circumstances, rather than from a desire to expand. For example, the conflict in the mid 7th century between the Bernicians and Dal Riatans over the strategically-important Lothians appears to have been the result of an aggressive policy of the Dal Riatans to maintain their territory, rather than make it larger (Fraser, 2009: 172). Furthermore, on some occasions motivational focus may have overlapped or even altered during a particular period; for example, Cadwallon is said to have forfeited his military advantage and the possibility of conquering large tracts of southern England after killing Edwin of Deira, by remaining in Northumbria for a year during AD 633 to undertake extended raiding, looting and killing before eventually being killed himself (Breeze, 2001: 145).

The textual evidence over these periods thus presents a picture of continuous low-level warfare conducted by an elite for short-term economic gains, with status and identity construction also crucial to the activity, and far larger numbers of combatants involved for particular conflicts. The key differences are, firstly, that social mobility in the EHP begins to progressively calcify, with pre-existing advantages of wealth or familial connections becoming increasingly more important than individual military prowess. Secondly, there was a greater willingness in the EHP to conduct warfare on a large-scale, the motivations frequently being political and expansionist, whereas during the LIA such occasions are interpreted as defensive or related to community 'honour'. In some ways, this model correlates very well with that suggested by the weapons evidence, and does not so much diverge from it at points as provide a more well-rounded view of activity. Unlike the weapons-based model, it suggests that large-scale conflicts could occur in the LIA, and that smaller-scale raiding was also endemic in the EHP; crucially, the motivations behind the occurrences of the former were not based either on short- or long-term economics but on specific threats or emotional slights. The latter does not contradict the earlier model, but simply adds to it.

8.6 Chapter discussion

This chapter draws on the preceding elements of the thesis to present a wider conception of warfare and violence. The implicit assumptions of myself and others on key aspects of the topic are here made explicit and tested, and a model of warfare is presented which it is hoped can both be used to analyse the form of conflict taking place in society at a particular period, and also be improved upon with the addition of more data.

The topic of warfare attracts considerable interest and research, yet while the assumptions underpinning that research may or may not be correct, they tend not to be questioned. The role of women as victims in conflict, the regard in which wider society held combatants, and the concept of warriors as naturally occurring (rather than being deliberately constructed), are among the most pervasive of these. Too many studies present the 'warrior' figure as unambiguously male, elite and socially desirable, while weapons are considered rigidly in terms of their relationship to each other and the way in which they might be used. The aim of the evidence presented here is to demonstrate the complexity and ambiguity of both. There was a considerable difference between the reality of combatants and the warrior ethos; who could become a combatant appears to have been a relatively flexible issue, and changed over time, while the social image of the combatant was not. Furthermore, neither being a warrior nor fitting the social image of such was necessarily enough for that image to be projected to the outside world; the creation of such an image (using iconography or grave goods) appears to have been a deliberate choice, although the reasons for identifying (or not identifying) with the warrior image are still unclear, as are any social parameters which may have dictated such a choice. The intention here has not been necessarily to prove anyone wrong, simply to follow good practice in critically considering the inherent biases in the mind of the modern researcher.

In light of those considerations, and the evidence from previous chapters, a general model of warfare in society has been developed, based on the evidence presented by the weapons of northern Britain. This focused on the primary importance of the role of status in society – how it is achieved, and by whom –

and the possible forms of economical motivations for conflict to occur. This model suggested patterns in the form of warfare which indicated certain similarities and differences between the periods under discussion. The LBA and LIA appeared relatively similar, while EHP modes of conflict developed from LIA practice. The situation in the EIA was entirely different from the others, which probably reflects the profound societal changes that occurred at the end of the LBA. However, this model, while appearing fundamentally sound, does require adjustment and additional complexity if it is to have a wider application.

The skeletal trauma, hilltop enclosures and textual evidence from northern Britain which might be used as additional sources of evidence on warfare proved to be, respectively, sparse, indirect and unreliable. In particular, the minimal, or entirely absent, osteoarchaeological evidence from all the time periods under discussion prevented an exploration of issues relating to pre- and proto-historic attitudes to females and non-combatants during times of conflict. A more reliable grasp of the relative proportions of trauma to males and females would clearly be beneficial, although the evidence does show that females were a target of violence. The location and form may suggest aggressive or active defensive actions on the part of those individuals, but the majority of females are unlikely to have taken an active role in conflict. Particularly in periods when a 'heroic', warrior ethos is present, it is of interest to identify when and why women (as non-warriors) would be targeted as recipients of violence. In these cases, it would also be interesting to contrast the treatment of females with the treatment of juveniles – were both considered non-combatants? Were both groups equally a target or 'off-limits'? Did attitudes change significantly between periods? The answers to such questions would significantly improve understanding of gender relations, social norms and the role and identity of the warrior in society, but are dependent on the possibility of further osteological data. It is also unfortunate that the majority of analytical nuance which might usefully expand the weapons-based model of warfare are suggested by textual evidence – the least reliable of the alternative sources considered here. It would be of benefit for further work to be conducted on explicitly and specifically considering the extent to which archaeological data and textual evidence support or contradict each other in this area. Finally, although

analysis of these sources of evidence was necessarily limited and superficial within this work, a more detailed and systematic approach to synthesising data from these sources may identify regional variation within conflict practices, which is not possible when working solely with the data from metal weapons.

Despite these reservations, the alternative sources of evidence discussed here combine to emphasise the importance of conflict to society; evidence of conflict, or symbolic reference to it, is found widely across all these time periods, and conflict itself appears central to individual or group constructions of identity. They also serve both to illuminate and ameliorate some of the problems with the model of warfare proposed in this chapter, the most crucial being its simplistic and occasionally inflexible approach. The addition of further data did not contradict the model, but introduced greater degrees of nuance, particularly in the key area of motivation. The scale, form and social implications of any given conflict will be greatly affected by the motivation of the aggressors, which in addition to short-term and long-term economic benefits can also include a desire for revenge, judicial justice or to avenge a slight to the honour of a community. In addition, clearly more than one motivation may drive conflict in a single period, or more than one motive may lie behind aggressive acts – both economic and revenge attacks are described as taking place in the LIA, while Cadwallon's campaign in Northumbria appears to have been both politically and economically motivated (Breeze, 2001: 145).

Chapter 9: Conclusion

"A sword never kills anybody; it is the tool in the killer's hand"
(Lucius Seneca, Line 30, Letter LXXXVII, Moral Letters to Lucilius)

This research project was begun with a very different direction in mind, both more generalised and more certain of its role within the research field, than that it has become. Initially intended as a study of the practicalities of combat over a more extended period than is usual, the nature of the developing dataset, with both its opportunities and intractable weaknesses, as well as a better understanding of wider published work, prompted continual changes of direction. At times focused purely on the inherent complexities of the material evidence, and others on the human agency that created and used that evidence, this work has attempted a level of balance between the two approaches. It now stands as both a series of projects, prompted by the data available and linked by a common theme, and a model for how the interaction between culture and economics directly impacts the nature of human conflict.

9.1 Study objectives

9.1.1 What role did warfare play in society?

Violence, conflict and warfare are usually presented as aberrant behaviours in society which cause significant harm, and certainly this is true of the first two. However, while causing much suffering and destruction, warfare may also be considered as a relatively normalised activity, fulfilling certain key roles in society – perhaps the most important of which is functioning as a mechanism through which control of power and resources is channeled. The achievement and retention of social power (in the form of kingships) is most evident in the EHP, although it is clearly possible that this motivation was relevant in earlier periods but remains invisible in the record. However, the cultural response to such mechanisms is interesting in that it fluctuates.

During the LBA, LIA and EHP there is a clear and constant link between those who adopt the persona of the warrior and those at the apex of society. These are amongst the wealthiest and most powerful members of the social group, which requires a level of collaboration on the part of society as a whole. Such activities and skills were considered desirable and exclusive by the majority of the population. During the early and middle IA warfare may well still be the method in which communities defend themselves and seize desired resources, but its practice is no longer evidently socially desirable or a means of identity creation; its role is functional, but not fashionable, and therefore both the warrior ethos and a desire to project the identity disappears. In its place, social hierarchies, wealth, power and identity are demonstrated through other channels, possibly including large-scale architecture and construction.

9.1.2 Who were the people who engaged in warfare?

During the periods when warfare was fashionable, warfare functioned as a crucial medium through which individuals could either adopt a specific role in life, an identity, or both. Not all those presented as warriors could have physically participated during their lifetime, and it is possible that some individuals or groups who never identified or presented as warriors could have taken part in warfare. Obviously a proportion of individuals would have combined both the identity and the functional role, but some individuals may only have related to one or the other. Whether a researcher is more interested in the role or the identity depends on whether a functional or anthropological approach is being taken, but this study takes the view that they are equally important, each reflecting an essential aspect of the topic.

Certain conclusions can be drawn regarding those who take on the role of warrior, and do the actual fighting. It is possible that women became combatants, as well as men. In most periods, those who did fight appear to have begun their training at a young, possibly pre-adolescent, age and would have spent a significant portion of their time in training. It is hard to know whether such training would have taken place during the EIA, since although the requirement for effective warriors was

presumably present, the social desirability of the activity was relatively low and may not have been a priority. When combatants did take part in conflicts there are indications that they fought in relatively small, undisciplined groups, or participated in single combats. Despite their social status in many periods, it is possible that the activities of warriors led to a level of ambiguity in the way they were regarded and therefore some degree of conscious re-integration into society was required.

Those who portrayed themselves as warriors (using iconography or burial evidence) may not necessarily have used the weapons with which they associated themselves, but either made the choice to construct that identity for posterity, or had it made for them by members of their communities. Given the link between warfare and control of resources and power, it is not hard to understand why this choice might be made. During the latter part of the EHP kingship became an identity that no longer required the individual to fulfil particular physical roles, but was instead conferred through other parameters – primarily genealogy. It is possible that the same process is visible here and that the reasons behind a warrior identification were more socially significant and culturally-based than whether that individual took part in combat.

The existence of a warrior ethos, and the construction of identities around it, is not in evidence during the EIA. During these periods, participants in combat were not likely to have consisted of a socially exclusive strata of well-trained individuals. Instead, a larger proportion of the population might have taken part, although without significant training or associated wealth and status.

9.1.3 What weapons were used in fighting, and how were they being used?

The assumption that swords are uniformly elite, while spears have less inherent status, less value and are less complex to wield, is incorrect both functionally and evidentially. Certainly in the LBA an effective spear-bearer would have needed comparative levels of training as that of a sword-bearer. Although it is not possible to ascertain modes of use once spears are made in iron, other sources of evidence

combine to indicate a weapon of significant status, with rules governing both use and deposition. It is, however, clear that both iron and bronze swords form part of the warrior identity, and are a clear form of social symbolism, in a way that the spears are not.

Not all weapons were considered suitable for use in warfare. Northern British conflicts did not normally include aerial weapons during the periods under discussion, possibly the result of a cultural taboo against killing at a distance. Should this be the case, it would have implications for spear use, given that it would be less likely that spears would have been thrown, and were instead retained for hand to hand fighting. The proscription of aerial weapons in the north is clearly at odds with the rest of Britain and parts of Europe.

9.2 Future research directions

The concluding sections of each chapter contain suggested directions for future research projects, but certain themes do recur over a number of chapters or only become apparent when the work is considered as a whole.

One of the biggest inhibitors to further work, both in terms of examining very specific groups of material or attempting to integrate sources of evidence, is the lack of catalogued material in northern Britain. Although there are a number of sources proposing typological series for LBA spearheads, there is as yet no catalogue of the material comparable to the Colquhoun & Burgess (1988) catalogue of swords. It is to be hoped that this will be rectified in the near future, as work is currently in progress on a *Prähistoriche Bronzefunde* volume on the subject. The IA and EHP spearheads have neither catalogue nor typology, other than that proposed here. More needs to be done to make this group of material available for broader study, and allowing it to be integrated, chronologically and regionally, with other material culture studies. In addition, the lack of catalogued osteological material is deeply felt here; skeletal evidence is perhaps the least ambiguous of the sources of information discussed in this study, yet the sources of information on it are inadequate to enable a thorough, synthesised discussion of the evidence. This may be due to a lack of osteological expertise or focus in more

wide-ranging studies and publications, or the result of a lack of specificity in terms of find locations, analysis or date, but it is hoped that a wider availability of source data would stimulate greater integration of osteological evidence with the topic of warfare as a whole.

The relative lack of catalogued material, typological series and adequate absolute dating has limited the degree of nuance that can be brought to analysis of the IA in this work. Furthermore, any analysis of the EHP weaponry is nearly impossible, in part because a lack of understanding of weapon development has led to the labelling of ferrous weapons that pre-date the early Medieval period as IA in date. Thus, very little material is ever recorded as dating to the EHP which leads to an inability to adequately study the material because the evidence is too sparse; this results in a self-perpetuating cycle preventing further progress. Continued efforts to catalogue and classify material, in conjunction with planned dating programmes, should form the next stages of research and prompt re-evaluation of the ferrous material.

The first stage of classification of iron spearheads was attempted in this study – despite a long history of difficulty in clustering and analysing the ferrous spearheads, and a general consensus that the qualities of the dataset make it impossible to meaningfully cluster the material. The approach taken is intended as preliminary, and its results are deliberately open to critique by those more experienced in the application of statistical procedures. It is not always sufficiently clear whether the clustering identified as the result of such procedures is a meaningful structure within the data or a product of the methods used. Even a cursory reading of the relevant literature demonstrates that results are entirely dependent on the methods and approaches chosen, and not an inherent aspect of the data. Although efforts have been made to ensure that the reasoning and approach taken in chapter 4 is explicit, clear and logical, it is sincerely hoped that more experienced statisticians and archaeologists might take an interest in this dataset, and that their expertise and knowledge will influence, adapt and improve the findings of this study.

In addition to the IA material, the LBA weapons panoply should also be re-assessed in light of some of the findings of this study, and that of Molloy (2006). The belief that none of the bronze shields of Britain could have been functional in combat is amazingly persistent, perhaps because after that interpretation became widely accepted it remained unchallenged for some decades. However, both Molloy's results, and those presented here, demonstrate that some shields certainly were capable of use in combat. Taking that reality as a starting point, use-wear analysis should be applied to determine the extent of use of metal shields; simply because they are capable of defence does not necessarily mean that they were used for such.

The offensive weapons of the LBA are also suitable for some level of re-examination. It is unfortunate that an understanding of what the damage form 'flattening' implied was only grasped after data collection was completed. As the only form of damage that could be linked to a specific combat behaviour, it would be of interest to re-assess bronze swords and spears to determine its extent and patterning. Similarly, identifying those swords with double, opposing bends would also be of particular interest when identifying which weapons were used in actual combat, rather than undergoing ritual or post-depositional damage. Finally, a study of the patterning of edge damage involving metal loss might suggest particular contexts, occasions or locations in which varying degrees of force were used in combat conditions.

Although much of the evidence points to combat weapons remaining the preserve of the elite, it would also be interesting to investigate whether tools that are not usually viewed as weapons (such as sickles, knives or axes) also exhibit any level of combat damage. If so, it may indicate an otherwise invisible level of socially inferior combatants, who might not normally be able to arm themselves traditionally, but who used what weapons they had to hand and what was familiar to them. This avenue of investigation would be of particular interest in the EIA, when traditional combat weapons are nearly entirely absent from the record, but conflict is still thought to occur which involves a larger proportion of the population than during the previous or subsequent eras. For this group of

combatants specialised weapons training would not have formed a significant part of their lives, and it is therefore logical to consider alternative weapons which may have been as effective but not as specialised or loaded with symbolism. The identification of a more socially varied range of combatants in the LBA, LIA and EHP would also substantially alter some of the interpretations made in this work.

Finally, there is one aspect of the material which might usefully be investigated. Where the provenance allows, the find locations of the database could be uploaded to the software MemoryMap. The advantage of this programme over that of ArcMap is that it shows a level of topographical detail on a par with Ordnance Survey maps, even having the capacity to present the landscape in 3D. As discussed by Hunter (forthcoming) there is likely to be benefit in observing trends or differences in the wider geographic location of the finds, rather than simply their context. Although trends towards deposition in particular or unusual locations has been noted, there is as yet no systematic study of these practices.

9.3 General conclusions

This study sought to explore the 'who', the 'what' and the 'why' of warfare in northern Britain over a period of two thousand years, and in so doing challenged some of the more pervasive stereotypes and assumptions associated with this theme. The value of the information contained within this work is in the incremental advances in understanding of some larger themes revolving around material culture studies, typology and social anthropology, rather than as a sweeping overview. As such, it seems appropriate that the quantity of further work proposed here outstrips the conclusions of the work itself.

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Appendix 1: The Database

The number of artefacts in the database, and the large number of fields containing information regarding them, makes the inclusion of the database in hard copy unfeasible, unless in an undesirably reduced format. The database is therefore available on CD ROM, at the back of this volume.

Explanation of Database Field Titles and Content

Where a cell is left empty in the database the information is either unknown, unavailable or inapplicable in that particular case. All measurements are in mm.

Within the database and Appendix 2 a number of abbreviations are used. These are as follows:

- **AJ**: Antiquaries Journal
- **Adlib**: National Museums of Scotland database
- **BM**: British Museum
- **C&B**: I. Colquhoun & C. Burgess' (1988) *The Swords of Britain* (with page number)
- **JCCI**: John Coles card index
- **NMS**: National Museums of Scotland
- **PAS**: Portable Antiquities Scheme
- **PSAS**: Proceedings of the Society of Antiquaries of Scotland (with volume and page number)
- **RCAHMS**: Royal Commission of Ancient and Historical Monuments of Scotland database
- **SAL**: Society of Antiquaries of London
- **SALM**: Society of Antiquaries of London Museum
- **Stead**: I.M. Stead's (2006) *British Iron Age Swords and Scabbards* (with page number)
- **Trans. Cumb. & West**.: Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society (with volume and page number)
- **York. Arch. J.**: Yorkshire Archaeological Journal (with volume and page number)

In addition to the descriptive labels explained in section 2.4.6, there are a number of other fields which are relevant to all tables in the database:

1. *Context*: B = burial, H = hoard, S = settlement
2. *Source Detail*: where the 'Source' is a journal the volume and page is provided (ie '8, 59'). Where the 'Source' is a catalogue the number provided is the catalogue number of the item.
3. *Secondary Date*: any other date relevant to the item, such as the year in which it was

purchased by a museum or published

Within the bronze spearheads table the data fields below can be explained as follows:

1. *Form*: B = barbed, F = flame, K = kite, L = leaf, O = ogival, T = triangular
2. *Extent of Shaft*: E = entire way through (more than halfway up the blade), M = majority of way through (up to halfway up the blade), S = socket only
3. *Loop Location*: B = within blade, J = junction
4. *Loop Size*: measured along the internal length of the flat side against the socket
5. *Rivet Location*: measured from the junction
6. *Section Shape*: 1 = round midrib/no channel/no accentuated bevel, 2 = RM/NC/AB, 3 = RM/C/AB, 4 = RM/C/NAB, 5-8 = same again but with a sharp midrib

Within the bronze swords table the data fields below can be explained as follows:

1. *Type*: A = Antennenschwerter, B = Ballintober, C = Caledonian, CT = Carps Tongue, EP = Ewart Park, G = Gündlingen, GR = Griffplattenschwerter, L = Limehouse, R = Rosnoën, SC = Solid Cast, T = Taplow, W = Wilburton
2. *Type of Pommel*: A = raised arms, E = 'bunny ears', F = fishtail, FL = flat, R = rounded, S = square, SC = solid cast

Within the iron spearheads table the data fields below can be explained as follows:

1. *Form*: D = diamond, F = flame, K = kite, L = leaf, O = ogival, P = pyramidal, T = triangular
2. *Shape at Widest Point*: A = angular, S = sinuous
3. *Section Shape*: 1 = round midrib/no channel/no accentuated bevel, 2 = RM/NC/AB, 3 = RM/C/AB, 4 = RM/C/NAB, 5-8 = same again but with a sharp midrib, 9 = pyramid, 10 = thin and flattened
4. *Rivet Location* and *Extent of Shaft* are both as detailed in the bronze spearhead table

Within the iron swords table the classificational groupings for scabbards, suspension loops, chapes and hilt end types were all taken from Stead's (2006) typology.

Appendix 2: Misidentified Items in the Database

The following were originally included in the database on the basis of prior identification as a weapon of the correct date and geographic area. Following examination, it was felt that these were misidentified, either in function or date. Where a revised identification placed the object outwith the parameters of this study, it was removed from the database (and marked with a '*' below).

Database Number	Find Location	Source	Initial Identification	Revised Identification
BSP106*	Little Kinnord	JCCI	Spear, LBA	Spear, EBA/MBA
BSP165*	Bannockburn	PSAS, 100: 201	Spear, LBA	Spear, MBA
BSP166*	Black Isle	PSAS, 93: 252	Spear, LBA	Spear, MBA
BSP201*	Unknown	Adlib	Spear, LBA	Spear, MBA
BSP205*	Scotland	Adlib	Spear, LBA	Spear, MBA
BSP206*	Carlusk	Adlib	Spear, LBA	Spear MBA
BSP209*	Clayyard	Adlib	Spear, LBA	Spear MBA
BSP216*	Northumberland	Adlib	Spear, LBA	Spear MBA
BSP244*	Castle Hill	RCAHMS	Spear, LBA	Spear MBA
BSP248*	Glen Tanar	RCAHMS	Spear, LBA	Spear, MBA
BSP260*	Loch Maree	RCAHMS	Spear, LBA	Palstave
BSP90*	Durris	JCCI	Spear, LBA	Spear, EBA/MBA
BSW177*	Loch Lednoc reservoir	PSAS, 115: 449	Sword, LBA	Knife or razor
BSW198*	Unknown	Adlib	Sword, LBA	Knife
BSW199*	Unknown	Adlib	Sword, LBA	Ornamental knife
BSW200*	Unknown	Adlib	Sword, LBA	Rapier, MBA
BSW237	Duddingston Loch	C&B, 234	Spear, LBA	Sword tip, LBA
BSW240	Duddingston Loch	C&B, 234	Spear, LBA	Sword tip, LBA
BSW239	Unknown	JCCI	Spear, LBA	Sword tip, LBA
BSW236	Duddingston Loch	C&B, 234	Spear, LBA	Sword tip, LBA
BSW238	Duddingston Loch	C&B, 234	Spear, LBA	Sword tip, LBA
DG112 *	Bannockburn	Unknown	Spear, LBA	Spear, MBA
BSW210*	Unknown	Adlib	Sword, LBA	Sword, EBA/MBA
ISP100*	Lyne	Adlib	Spear, IA	Spear, Roman
ISP101*	Lyne	Adlib	Spear, IA	Spear, Roman
ISP103*	Mumrills	Adlib	Spear, IA	Spear, Roman
ISP104*	Mumrills	Adlib	Spear, IA	Spear, Roman
ISP105*	Mumrills	Adlib	Spear, IA	Spear, Roman
ISP106*	Mumrills	Adlib	Spear, IA	Spear, Roman
ISP107*	Mumrills	Adlib	Spear, IA	Spear, Roman
ISP108*	Mumrills	Adlib	Spear, IA	Spear, Roman

ISP109*	Mumrills	Adlib	Spear, IA	Spear, Roman
ISP110*	Camelon	Stead, 223	Spear, IA	Knife
ISP120*	Dunadd	Adlib	Spear, IA	Palette knife
ISP122*	Dunadd	Adlib	Spear, IA	Knife
ISP123*	Dunadd	Adlib	Spear, IA	Knife
ISP128*	Dunadd	Adlib	Spear, IA	Knife
ISP131*	Castle Hill	Adlib	Spear, IA	Lynchpin
ISP132*	Cleaves Cove	Adlib	Spear, IA	Large nail
ISP144*	River Irvine	RCAHMS	Spear, IA	Medieval
ISP30*	Fisher Street	Trans. Cumb. & West, 98: 22	Spear, IA	Roman standard tip
ISP5*	Grishipoll Bay	PSAS, 110: 536	Spear, IA	Viking
ISP7*	Keiss Harbour	PSAS, 131: 134	Spear, IA	Stone
ISP81*	Malton	York. Arch. J., 59: 196	Spear, IA	Viking
ISW74*	Eadarloch	Adlib	Sword, IA	Knife/dirk fragment
ISW85*	Stirling Bridge	RCAHMS	Sword, IA	Medieval

Appendix 3: Database Information Sources

In order to locate material for the database, the most recent catalogues (Colquhoun & Burgess, 1988; Stead, 2006) were examined, and manual searches were conducted of the Portable Antiquities Scheme website, the NMS database, and the RCAHMS database.

In addition, a number of journals were searched, from their initial publication until March, 2007:

- The Antiquaries Journal
- Antiquity
- Archaeological Journal
- Archaeological Review
- Current Archaeology
- Britannia
- Durham Archaeological Journal
- Glasgow Archaeological Journal
- Journal of Archaeological Science
- The Journal of the Arms and Armour Society
- Medieval Archaeology
- Northern History
- Oxford Journal of Archaeology Proceedings of the Prehistoric Society
- Proceedings of the Society of Antiquaries of Scotland
- Scottish Archaeological Review
- Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society
- Yorkshire Archaeological Journal
- Yorkshire Archaeology

These journals were searched from their initial publication until March, 2007.

A small number of items mentioned in these sources that are believed to be within the geographical and chronological parameters of this work may have been excluded from the database for a number of reasons:

- The material in question has no associations *and* is sufficiently fragmentary as to be unable to determine its place in the chronological record from form alone

- No current location *or* sufficient information regarding type or condition is provided, so that the possibility of personal examination is excluded and no relevant information can be provided by the source itself regarding the material

To be included with limited data or no current location, the report must convincingly state at the least what period the artefact relates to and have some geographic fixture (e.g. Scotland).

The initial database supplied by RCAHMS provided general text and bibliographic searches in database form which needed to be sifted to exclude material not relevant to this study. The database was modified to exclude those items included that were chronologically outwith the scope of this thesis. Additionally, any record classified as 'Roman' or 'Viking' in the 'Period' or 'Classsub' fields, any record with an 'Orkney Islands' or 'Shetland Islands' 'Couname' field and any described as being other than iron or bronze (such as flint or chert) in the 'Classsub' field were removed. Subsequent searches in the Report field removed records that were outside the parameters of this study for any reason. It should be noted that there were several problems in trying to merge the data gathered from RCAHMS with that gathered from the literary sources: the findspots, particularly those finds from the early 20th and late 19th centuries, were liable to variations in spelling, making it difficult to identify whether the same place of find was meant. Further, some sites are referred to by several names and where multiple names are not listed it is not possible to identify the overlaps.

An advanced search was compiled using the PAS database. Fields included:

- 'Object Type', 'contains', 'SWORD' and
- 'Object Description', 'contains', 'sword' and
- 'Period From', 'is exactly', 'BRONZE AGE', and
- 'County', 'is exactly', 'Cumbria'

This search was repeated using all available combinations of the following Object Type:

- 'ARMOUR'
- 'ARMOUR AND WEAPONS'
- 'ARROW'
- 'HELMET'
- 'MAIL ARMOUR'
- 'SCABBARD'
- 'SHIELD'

- 'SPEAR'
- 'WEAPON'

And Object Description:

- 'Blades'
- 'Chape'
- 'Chape object'
- 'Pommel'
- 'Scabbard chape'
- 'Scabbard fitting'
- 'Shield boss'
- 'Shield mount'
- 'Spearhead'
- 'Sword chape'
- 'Sword fitting'
- 'Sword pommel'

Additional periods searched were 'IRON AGE', 'PREHISTORIC' and 'EARLY MEDIEVAL', while additional counties searched were Durham, East Riding of Yorkshire, Humberside, North Yorkshire, Northumberland, South Yorkshire, Tyne and Wear, West Yorkshire.

Further to this, the catalogues of Colquhoun & Burgess (1988) and Stead (2006), the unpublished Coles card catalogue held in the NMS, and the NMS database, were used to identify LBA weapons and IA weapons not found during the course of the above searches. Material from the Colquhoun and Burgess and Stead catalogues was excluded if described as fragmentary to the extent that basic classification could not be conducted, if present whereabouts were unknown and, in two cases, where the weapons were held in collections abroad.

These searches were completed by 28/03/07, although a very small number of items have since been added to the database, new finds having been brought to my attention through the kind assistance of museum staff.

Appendix 4: Strikes And Results Of Experimental Work

The following are the strikes that were made during the experiments described in Chapter 4, in the order in which they were made. Note that each type of strike was made twice, one after the other, to test replicability.

- Strike 1, Attempt 1 – underarm spear thrust to leather shield
- Strike 1, Attempt 2 – underarm spear thrust to leather shield
- Strike 2, Attempt 1 – straight spear stab to leather shield
- Strike 2, Attempt 2 – straight spear stab to leather shield
- Strike 3, Attempt 1 – underarm spear strike to metal shield
- Strike 3, Attempt 2 – underarm spear strike to metal shield
- Strike 4, Attempt 1 – straight spear thrust to metal shield
- Strike 4, Attempt 2 – straight spear thrust to metal shield
- Strike 5, Attempt 1 – overarm spear stab to metal shield
- Strike 5, Attempt 2 – overarm spear stab to metal shield
- Strike 6, Attempt 1 – overarm spear stab to leather shield
- Strike 6, Attempt 2 – overarm spear stab to leather shield
- Strike 7, Attempt 1 – slashing down with sword onto edge of leather shield
- Strike 7, Attempt 2 – slashing down with sword onto edge of leather shield
- Strike 8, Attempt 1 – slashing down with sword onto face of leather shield
- Strike 8, Attempt 2 – slashing down with sword onto face of leather shield
- Strike 9, Attempt 1 – slashing down with sword onto edge of metal shield
- Strike 9, Attempt 2 – slashing down with sword onto edge of metal shield
- Strike 10, Attempt 1 – slashing down with sword onto face of metal shield
- Strike 10, Attempt 2 – slashing down with sword onto face of metal shield
- Strike 11, Attempt 1 – spear slashing down onto edge of leather shield
- Strike 11, Attempt 2 – spear slashing down onto edge of leather shield
- Strike 12, Attempt 1 – spear slashing down onto edge of metal shield
- Strike 12, Attempt 2 – spear slashing down onto edge of metal shield
- Strike 13, Attempt 1 – spear slashing across edge of leather shield
- Strike13, Attempt 2 – spear slashing across edge of leather shield

- Strike 14, Attempt 1 - spear slashing across edge of metal shield
- Strike 14, Attempt 2 – spear slashing across edge of metal shield
- Strike 15, Attempt 1 – back handed spear slash to leather shield
- Strike 15, Attempt 2 – back handed spear slash to leather shield
- Strike 16, Attempt 1 – back handed spear slash to metal shield
- Strike16, Attempt 2 – back handed spear slash to metal shield
- Strike 17, Attempt 1 – sword stab to face of leather shield
- Strike 17, Attempt 2 – sword stab to face of leather shield
- Strike 18, Attempt 1 – sword stab to leather shield, blocking with lower edge
- Strike 18, Attempt 2 – sword stab to leather shield, blocking with lower edge
- Strike 19, Attempt 1 – sword stab to metal shield face
- Strike19, Attempt 2 – sword stab to metal shield face
- Strike 20, Attempt 1 - sword stab to metal shield blocked with lower edge
- Strike 20, Attempt 2 – sword stab to metal shield blocked with lower edge
- Strike 21, Attempt 1 – sword slash to leather shield blocked with shield face
- Strike 21, Attempt 2 – sword slash to leather shield blocked with shield face
- Strike 22, Attempt 2 – sword slash to leather shield blocked with edge
- Strike 22, Attempt 1 – sword slash to leather shield blocked with edge
- Strike 23, Attempt 1 – sword slash to metal shield blocked with face
- Strike 23, Attempt 2 – sword slash to metal shield blocked with face
- Strike 24, Attempt 1 - sword slash to metal shield blocked with edge
- Strike 24, Attempt 2 – sword slash to metal shield blocked with edge
- Strike 25, Attempt 1 – edge of spear slashes down onto edge of sword that is held horizontal to the ground, weapons held at 90˚ to each other; sword held immobile
- Strike25, Attempt 2 – edge of spear slashes down onto edge of sword that is held horizontal to the ground, weapons held at 90˚ to each other; sword held immobile
- Strike 26, Attempt 1 – edge of sword slashes down onto edge of spear that is held horizontal to the ground, weapons held at 90˚ to each other; spear is held immobile
- Strike 26, Attempt 2 – edge of sword slashes down onto edge of spear that is held horizontal to the ground, weapons held at 90˚ to each other; spear is held immobile
- Strike 27, Attempt 1 – spear edge slashes down onto edge of sword held horizontally to ground, weapons held at 45˚ to each other; sword is held immobile
- Strike 27, Attempt 2 – spear edge slashes down onto edge of sword held horizontally to ground, weapons held at 45˚ to each other; sword is held immobile

- Strike 28, Attempt 1 – spear edges slashes diagonally down at an angle onto sword held immobile and horizontal to ground; sword is held immobile
- Strike28, Attempt 2 - spear edges slashes diagonally down at an angle onto sword held immobile and horizontal to ground; sword is held immobile
- Strike 29, Attempt 1 - spear edge slashes diagonally down onto other spear (held immobile and horizontal to ground), both weapons held at 90˚to each other
- Strike 29, Attempt 2 - spear edge slashes diagonally down onto other spear (held immobile and horizontal to ground), both weapons held at 90˚to each other
- Strike 30, Attempt 1 - spear slashes down onto flat of sword held immobile and horizontal to the ground
- Strike 30, Attempt 2 - spear slashes down onto flat of sword held immobile and horizontal to the ground
- Strike 31, Attempt 1 - throwing spear at leather shield (propped on straw bales 2ft from ground) from 3 metres away
- Strike 31, Attempt 2 - throwing spear at leather shield (propped on straw bales 2ft from ground) from 3 metres away
- Strike 32, Attempt 1 - throwing spear at metal shield (propped on straw bales 2ft from ground) from 3 metres away
- Strike 32, Attempt 2 - throwing spear at metal shield (propped on straw bales 2ft from ground) from 3 metres away

The following are the notes and results from the above experiments:

(Note: the side of the spear that has no rivet hole in the socket is Side 1, while the side that does have a rivet hole is Side 2. The shields are divided into 8 equal quadrants, numbered clockwise from the top of the shield – see Fig. 15)

Strike 1, Attempt 1 – underarm thrust to leather shield (spear 1)

Previous Damage	Hammer marks side 1 from rivet at base of wing. Some very minor dents by tip caused by casting.
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Slash and small hole. Total slash was 45mm, penetration of shield within that was 12mm. Quadrant 5, inner area.
Other Notes	Hot sunny weather. JP defending.

Strike 1, Attempt 2 – underarm thrust to leather shield (spear 1)

Previous Damage	See S1,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Large hole in shield, 45mm across (rib prevented it from being larger). Spear was buried 86mm from tip. Quadrant 5, inner area.
Other Notes	Hot sunny weather. JP defending.

Strike 1, Attempt 3 – underarm thrust to leather shield (spear 2)

Previous Damage	See S1,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Small slash leading to 10mm hole, non-penetrative. Quadrant 5, inner area.
Other Notes	Hot sunny weather. JP defending.

Strike 1, Attempt 4 – underarm thrust to leather shield (spear 2)

Previous Damage	See S1,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Small slash leading to 7mm hole, non-penetrative. Quadrant 5, inner area.
Other Notes	Hot sunny weather. JP defending.

Strike 2, Attempt 1 – straight stab to leather shield (spear 2)

Previous Damage	Minor dents by tip caused by casting.
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Diamond shaped 10mm hole, slightly penetrative. Quadrant 3, outer area.
Other Notes	Hot sunny weather. JP defending.

Strike 2, Attempt 2 – straight stab to leather shield (spear 2)

Previous Damage	See S2,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Diamond shaped 11mm hole, slightly penetrative. Quadrant 4, outer area.
Other Notes	Hot sunny weather. JP defending.

Strike 3, Attempt 1 – underarm strike to metal shield (spear 2)

Previous Damage	See S2,A1
Damage to Spear, side 1	Tiny flattening of tip.
Damage to Spear, side 2	None
Damage to Shield	Scratch 16mm long, with minor denting. Denting across flat and ridge. Quadrant 1, inner area.

Other Notes	Hot sunny weather. LR defending.

Strike 3, Attempt 2 – underarm strike to metal shield (spear 3)

Previous Damage	Small amount of casting dents to tip
Damage to Spear, side 1	Around 1.5mm sheared off tip.
Damage to Spear, side 2	None
Damage to Shield	Scratch 42mm long, minor denting. Denting across flat and ridge. Quadrant 2, inner area.
Other Notes	Hot and sunny weather, LR defending.

Strike 4, Attempt 1 – straight thrust to metal shield (spear 4)

Previous Damage	Small amount of casting damage to tip.
Damage to Spear, side 1	Tiny bend (around 1mm) straight over.
Damage to Spear, side 2	None
Damage to Shield	Small (2mm) diamond shaped dent (around 1mm deep), next to rivet. Quadrant 4, boss.
Other Notes	Hot and sunny weather. LR defending.

Strike 4, Attempt 2 – straight thrust to metal shield (spear 5)

Previous Damage	Small amount of casting damage to tip.
Damage to Spear, side 1	Possible miniscule amount of bend/chip. Can re-use.
Damage to Spear, side 2	None
Damage to Shield	Small (2mm) rectangular dent on rivet face. Quadrant 4, boss.
Other Notes	Hot and sunny weather, LR defending.

Strike 5, Attempt 1 – overarm stab to metal shield (spear 5)

Previous Damage	See S4,A2.
Damage to Spear, side 1	No damage
Damage to Spear, side 2	None
Damage to Shield	Very superficial scratch, 17mm long. Quadrant 1, inner area.
Other Notes	Hot and sunny weather, JP defending. Difficulties with safety associated with this strike forced each fighter to hold back and be too cautious.

Strike 5, Attempt 2 – overarm stab to metal shield (spear 5)

Previous Damage	See S4,A2.
Damage to Spear, side 1	Possible tiny chip in side.
Damage to Spear, side 2	None
Damage to Shield	Small (1mm) circular fairly deep indentation. Quadrant 8, inner area.
Other Notes	Hot and sunny weather. JP defending. Too enable safe practice JP knelt down rather than stood.

Strike 6, Attempt 1 – overarm stab to leather shield (spear 6)

Previous Damage	Small chip/notch from side A, 4mm from tip.
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Slash and tear, 32mm long. Quadrant 8, inner area.
Other Notes	Hot and sunny weather. JP defending.

Strike 6, Attempt 2 – overarm stab to leather shield (spear 6)

Previous Damage	See S6,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Slash and tear, 32mm long. Quadrant 8, boss.
Other Notes	Hot and sunny weather. JP defending.

Strike 7, Attempt 1 – slashing down with sword onto edge of leather shield

Previous Damage	N/A
Damage to Sword	None
Damage to Shield	Long, non-penetrative slash, 103mm long. Quadrant 1, outer area.
Other Notes	Hot and sunny weather. LR defending.

Strike 7, Attempt 2 – slashing down with sword onto edge of leather shield

Previous Damage	N/A
Damage to Sword	None
Damage to Shield	Long non-penetrative slash, 104mm long. Quadrant 1, outer edge.
Other Notes	Hot and sunny weather. LR defending.

Strike 8, Attempt 1 – slashing down with sword onto face of leather shield

Previous Damage	N/A
Damage to Sword	None
Damage to Shield	Very long (416mm) superficial scratch to face of shield. Quadrant 1, right across face.
Other Notes	Hot and sunny weather, LR defending.

Strike 8, Attempt 2 – slashing down with sword onto face of leather shield

Previous Damage	N/A
Damage to Sword	None
Damage to Shield	Very long (484mm) superficial scratch to face of shield. Quadrant 1, right across face.
Other Notes	Hot and sunny weather, LR defending.

Strike 9, Attempt 1 – slashing down with sword onto edge of metal shield

Previous Damage	N/A
Damage to Sword	Long shallow bow
Damage to Shield	Small dent to rim, 5mm long. Quadrant 8, outside area.
Other Notes	Hot and sunny weather. JP defending.

Strike 9, Attempt 2 – slashing down with sword onto edge of metal shield

Previous Damage	N/A
Damage to Sword	Short bow and series of blunting/flattening over distance of about 3cm along edge of blade.
Damage to Shield	Small dent to rim, 5mm long. Also entire face of shield in that area bent backwards slightly. Quadrant 1, outside area.
Other Notes	Hot and sunny weather, JP defending.

Strike 10, Attempt 1 – slashing down with sword onto face of metal shield

Previous Damage	N/A
Damage to Sword	Series of 3 very small bows spaced evenly apart from contact with the shield ridges.
Damage to Shield	Superficial scratches in a straight line across the top of the three outside ridges, 108mm long. Quadrant 1, outside area.
Other Notes	Hot and sunny weather, JP defending.

Strike 10, Attempt 2 – slashing down with sword onto face of metal shield

Previous Damage	N/A
Damage to Sword	No apparent damage
Damage to Shield	Very large dent in boss, 49mm long, 25mm wide and 5mm deep. Quadrant 2, boss area.
Other Notes	Hot and sunny weather. JP defending. When the shield boss is dented it is very painful on the hand.

Strike 11, Attempt 1 – slashing down onto edge of leather shield (spear 6)

Previous Damage	See S6,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Slashy cut and minor bend, 52mm long. Q7, outer area.
Other Notes	Hot and sunny weather. JP defending.

Strike 11, Attempt 2 – slashing down onto edge of leather shield (spear 6)

Previous Damage	See S6,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Long slashy cut and bend to edge,

	60mm long. Quadrant 8, outside area.
Other Notes	Hot and sunny weather. LR defending.

Strike 12, Attempt 1 – slashing down onto edge of metal shield (spear 6)

Previous Damage	See S6,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Small scratch to rim 3mm wide and 7mm long. Serious bend. Quadrant 8, oustside area.
Other Notes	Hot and sunny weather. JP defending.

Strike 12, Attempt 2 – slashing down onto edge of metal shield (spear 6)

Previous Damage	See S6,A1
Damage to Spear, side A	21mm long blunting from tip down
Damage to Spear, side 2	None
Damage to Shield	Scratches across top of five outside ridges, 103mm length total. Slight bend in rim. Quadrant 1, outside area.
Other Notes	Hot and sunny weather. LR defending.

Strike 13, Attempt 1 – slashing across edge of leather shield (spear 7)

Previous Damage	Micro damage to side B (minor nick). Slight amount of uneven casting at tip.
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Shallow wide cut to Quadrant 2, outer area, 42mm long.
Other Notes	Hot and sunny weather. JP defending. Had to move ground slightly to less gravelly area to provide more purchase for fighters feet. Had to use shorter shaft on slashing movements to allow necessary force – the longer one lacked strength.

Strike13, Attempt 2 – slashing across edge of leather shield (spear 7)

Previous Damage	See S13,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Deep dent and superficial slash 110mm long. Quadrant 1, outer area.
Other Notes	Hot and sunny area. LR defending. No gravel, short shaft.

Strike 14, Attempt 1 - slashing across edge of metal shield (spear 7)

Previous Damage	See S13,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Small dent to shield rim.
Other Notes	Hot and sunny weather. JP defending.

	No gravel, short shaft.

Strike 14, Attempt 2 – slashing across edge of metal shield (spear 7)

Previous Damage	See S13,A1
Damage to Spear, side 1	4 long blunted areas where it hit the ridges on shield; these were slightly bent over. Each one 11mm long, total length was 75mm.
Damage to Spear, side 2	None
Damage to Shield	Dent on boss from shaft, tiny superficial scratches across the top of four outer ridges. Quadrant 1, outer area. Each one 4mm long, 79mm total length.
Other Notes	Hot and sunny weather. LR defending. No gravel, short shaft.

Strike 15, Attempt 1 – back handed slash to leather shield (spear 10)

Previous Damage	Tiny nick near tip on side B and some small tip casting damage.
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Small slash and hole, total 20mm long. Quadrant 7, outside area.
Other Notes	Hot and sunny. JP defending. Short shaft.

Strike 15, Attempt 2 – back handed slash to leather shield (spear 10)

Previous Damage	See S15,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	1st=218mm long shallow scratch, Q8, inner area and boss. 2nd=very shallow scratch 95mm long, Q7, outer area with some deeper scratches further in.
Other Notes	Hot and sunny. LR defending. Short shaft. Had to make two attempts because first strike hit face, rather than edge.

Strike 16, Attempt 1 – Back handed slash to metal shield (spear 10)

Previous Damage	See S15,A1
Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Shield bent slightly in Q8 but no nicks or scratches so no photo.
Other Notes	Hot and sunny. JP defending. Short shaft.

Strike16, Attempt 2 – back handed slash to metal shield (spear 10)

Previous Damage	See S15,A1

Damage to Spear, side 1	None
Damage to Spear, side 2	None
Damage to Shield	Deep dent and shallow bend on rim, Q8. Scratch on rim and outer ridge 4mm long.
Other Notes	Hot and sunny. LR defending. Short shaft.

Strike 17, Attempt 1 – sword stab to face of leather shield

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	Small stab wound 10mm long, Q7, outside area
Other Notes	Hot and sunny. JP defending.

Strike 17, Attempt 2 – sword stab to face of leather shield

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	Large penetrative hole 38mm long, the sword went in 54mm up blade.
Other Notes	Hot and sunny. LR defending.

Strike 18, Attempt 1 – sword stab to leather shield, blocking with lower edge

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	V-shaped cut to outer edge, 6mm deep, Q3.
Other Notes	Hot and sunny. JP defending.

Strike 18, Attempt 2 – sword stab to leather shield, blocking with lower edge

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	None – just broke small wax deposit on outer edge
Other Notes	Hot and sunny, LR defending.

Strike 19, Attempt 1 – sword stab to metal shield face

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	Small scratch/dent on Q8, outer area, 4mm long.
Other Notes	Hot and sunny. JP defending.

Strike19, Attempt 2 – sword stab to metal shield face

Previous Damage	See all above
Damage to Sword	Very minor blunting to tip of sword
Damage to Shield	Very small punch dent to shield, Q6, outer area.
Other Notes	Hot and sunny. LR defending.

Strike 20, Attempt 1 - sword stab to metal shield blocked with lower edge

Previous Damage	See all above
Damage to Sword	Combination of bowing, scoring and tearing, 14mm long, at line between A2 and A3.
Damage to Shield	Small score on rim, 3mm, Q6.
Other Notes	Hot and sunny weather. JP defending.

Strike 20, Attempt 2 – sword stab to metal shield blocked with lower edge

Previous Damage	See all above
Damage to Sword	Combination of chipping and tearing in the same place as A1, 6mm.
Damage to Shield	Small score on rim, 4mm, Q6
Other Notes	Hot and sunny weather. LR defending.

Strike 21, Attempt 1 – sword slash to leather shield blocked with shield face

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	Superficial long thin scratch, 477mm, Q1-4 all across face.
Other Notes	Overcast and cool. JP defending.

Strike 21, Attempt 2 – sword slash to leather shield blocked with shield face

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	Superficial long thin scratch, 535mm long, Q6-8 across face.
Other Notes	Overcast and cool. LR defending.

Strike 22, Attempt 1 – sword slash to leather shield blocked with edge

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	Short, diagonal, non-penetrative slash, 34mm long. Q2, outer area.
Other Notes	Overcast and cool. JP defending.

Strike 22, Attempt 2 – sword slash to leather shield blocked with edge

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	37mm superficial scratch preceded by scraping of leather. Q3, outer area.
Other Notes	Overcast and cool. LR defending.

Strike 23, Attempt 1 – sword slash to metal shield blocked with face

Previous Damage	See all above
Damage to Sword	None

Damage to Shield	130mm large dent distortion within face (Q3, inner area), very minor scratch.
Other Notes	Overcast and cool. JP defending.

Strike 23, Attempt 2 – sword slash to metal shield blocked with face

Previous Damage	See all above
Damage to Sword	None
Damage to Shield	Large dent distortion within face (Q6&7, outer area), 150mm long. Very minor scratch.
Other Notes	Overcast and cool. LR defending.

Strike 24, Attempt 1 - sword slash to metal shield blocked with edge

Previous Damage	See all above
Damage to Sword	27mm flattened area on edge in Area 3.
Damage to Shield	4mm scratch on rim and minor dent in Q5.
Other Notes	Overcast and cool. JP defending.

Strike 24, Attempt 2 – sword slash to metal shield blocked with edge

Previous Damage	See all above
Damage to Sword	Combination of chip and tear, Area3, 9mm long.
Damage to Shield	8mm scratch and 70mm v-shaped dent in rim, Q6.
Other Notes	Overcast and cool. LR defending.

Strike 25, Attempt 1 – edge of spear slashes down onto edge of sword that is held horizontal to the ground, weapons held at 90˚ to each other; sword held immobile
(spear 11)

Previous Damage	Small tip casting damage
Damage to Spear	Bow, lower area, 6mm long
Damage to Sword	Notch/score/tear, A3, 10mm long and 7mm deep
Other Notes	Warm and sunny. LR holding sword. Initially JP missed, spear shaft struck the sword, breaking the shaft off. For all spear and sword strikes, one weapon was held in position almost immobile but moving to meet the other slightly while the other was used fast. This was to prevent issues with missing and safety.

Strike25, Attempt 2 – edge of spear slashes down onto edge of sword that is held horizontal to the ground, weapons held at 90˚ to each other; sword held immobile (spear 12)

Previous Damage	None
Damage to Spear	Chip, lower area, 3mm long and 1mm deep

Damage to Sword	Notch/tear, A3, 6mm long and 5mm deep.
Other Notes	Warm and sunny. LR holding sword.

Strike 26, Attempt 1 – edge of sword slashes down onto edge of spear that is held horizontal to the ground, weapons held at 90˚ to each other; spear is held immobile
(spear 11)

Previous Damage	See S25,A1
Damage to Spear	Chip, lower area, 3mm long and 1mm deep
Damage to Sword	Nick/tear, area 3, 10mm long and 4mm deep
Other Notes	Warm and sunny. LR holding sword.

Strike 26, Attempt 2 – edge of sword slashes down onto edge of spear that is held horizontal to the ground, weapons held at 90˚ to each other; spear is held immobile
(spear 12)

Previous Damage	None
Damage to Spear	Chip, upper area, 4mm long and 1mm deep
Damage to Sword	Notch/tear, A3, 4mm long and 4mm deep
Other Notes	Warm and sunny. LR holding sword. JP missed on first attempt and the spear shaft cracked so we needed to re-shaft.

Strike 27, Attempt 1 – spear edge slashes down onto edge of sword held horizontally to ground, weapons held at 45˚ to each other; sword is held immobile (spear 13)

Previous Damage	None
Damage to Spear	Chip, lower area, 4mm long and 2mm deep
Damage to Sword	Tear in both directions, A3, 4mm deep
Other Notes	Warm and sunny. LR holding sword.

Strike 27, Attempt 2 – spear edge slashes down onto edge of sword held horizontally to ground, weapons held at 45˚ to each other; sword is held immobile (spear 13)

Previous Damage	None
Damage to Spear	Chip/tear, lower area, 4mm long, 1mm deep
Damage to Sword	Tear in both directions, A3, 3mm deep. Slight cracking in metal on either side of tear.
Other Notes	Warm and sunny. LR holding sword.

Strike 28, Attempt 1 – spear edges slashes diagonally down at an angle onto sword held immobile and horizontal to ground; sword is held immobile (spear 14)

Previous Damage	None
Damage to Spear	Chip, with bow on one side and scratch on the other. Lower area, 3mm long and 1mm deep.
Damage to Sword	Double chip and bow, A2, 21mm length

	total and 2mm deep.
Other Notes	Warm and sunny. LR holding sword.

Strike28, Attempt 2 - spear edges slashes diagonally down at an angle onto sword held immobile and horizontal to ground; sword is held immobile (spear 14)

Previous Damage	None
Damage to Spear	Chip, upper area, 4mm long and 2mm deep.
Damage to Sword	Nick and tear, A3, 6mm long and 4mm deep.
Other Notes	Warm and sunny. LR holding sword.

Strike 29, Attempt 1 - spear edge slashes diagonally down onto other spear(held immobile and horizontal to ground), both weapons held at 90˚to each other (spears 15 and 16)

Previous Damage	None
Damage to Spear 15	Chip
Damage to Spear 16	Chip and scratch across wing and midrib
Other Notes	Overcast and warm. LR holding attacking spear.

Strike 29, Attempt 2 - spear edge slashes diagonally down onto other spear (held immobile and horizontal to ground), both weapons held at 90˚to each other (spears 15 and 16)

Previous Damage	See S29,A1
Damage to Spear 15	Chip
Damage to Spear 16	Chip
Other Notes	Overcast and warm. LR holding attacking spear. Chips were exactly the same as the others when attacking sword in shape and size.

Strike 30, Attempt 1 - spear slashes down onto flat of sword held immobile and horizontal to the ground (spear 15)

Previous Damage	See all above
Damage to Spear	Slight tip bend
Damage to Sword	Series of mini dents, very wide and shallow
Other Notes	Overcast and warm. LR holding attacking spear.

Strike 30, Attempt 2 - spear slashes down onto flat of sword held immobile and horizontal to the ground (spear 15)

Previous Damage	See all above
Damage to Spear	Slight blunting 15mm long on edge right next to tip.
Damage to Sword	Very minor , wide and shallow dent
Other Notes	Overcast and warm, LR holding attacking spear.

Strike 31, Attempt 1 - throwing spear at leather shield (propped on straw bales 2ft from

ground) from 3 metres away (spear 17)

Previous Damage	None
Damage to Spear	None
Damage to Shield	Penetrative hole shaped exactly like spearhead section
Other Notes	Overcast and warm. KA throwing spear.

Strike 31, Attempt 2 - throwing spear at leather shield (propped on straw bales 2ft from ground) from 3 metres away (spear 17)

Previous Damage	None
Damage to Spear	None
Damage to Shield	Penetrative hole shaped exactly like spearhead section
Other Notes	Overcast and warm. JP throwing spear.

Strike 32, Attempt 1 - throwing spear at metal shield (propped on straw bales 2ft from ground) from 3 metres away (spear 18)

Previous Damage	None
Damage to Spear	None
Damage to Shield	Small, roughly oval hole
Other Notes	Overcast and warm. LR throwing spear.

Strike 32, Attempt 2 - throwing spear at metal shield (propped on straw bales 2ft from ground) from 3 metres away (spear 18)

Previous Damage	None
Damage to Spear	None
Damage to Shield	Small, roughly oval hole
Other Notes	Overcast and warm. JP throwing spear. When thrown by professional spearcaster in later work, the spear penetrated more deeply, beginning to show that distinctive section-shaped form.

Appendix 5: Cosmos Paper

Lives Set in Stone: The Preoccupations of the Elites of Early Historic Scotland

Introduction

The Early Historic carved stone monuments found in Scotland have long been subject to intense scrutiny, the meaning of their symbols and the function of the stones frequently the main topic of debate (Close-Brooks 1980; Jackson 1993; Shepherd & Shepherd 1977; Southwick 1981). It is rare for their art historical value or potential function to be set aside in favour of studies focusing on those stones depicting human existence and interaction. However, when approached in this way it becomes clear that a rich source of information on the preoccupations and values of the elites of Early Historic Scotland is before our eyes. Although only found on a relatively small proportion of the total number of stones, a significant number depict human activity, frequently dominated by the themes of religion (in the form of Christian imagery), warfare and hunting. Examination of the relative proportions these stones are found in, their specific content and context, and the arrangement of different elements within them should shed light on how these themes relate to each other, and what level of importance they were accorded culturally.

Methodology

Defining the parameters of an appropriate data set is not an easy task; at present, many stones mentioned in early works (eg. Buist, 1851; Laing, 1851; Stuart, 1854) are kept in private hands, their whereabouts are unknown or they have become weathered to such an extent that examination and analysis are no longer possible. The catalogue compiled by Allen & Anderson in 1903 was extraordinarily comprehensive and remains a primary reference point for scholars in this area. Thanks to the enormous corpus of illustrations their volumes contain,

it is possible to consider evidence from stones no longer available for immediate study. Therefore, this paper has taken as its data set all the monuments illustrated in Allen & Anderson (1993), with a few exclusions. Those stones that are too weathered to be legible have been excluded, as have those featuring only creatures with both human and animal characteristics. While the majority of the monuments can be attributed to Pictland, there are stones, such as that at Barochan, found elsewhere in Scotland and these have been deliberately included in order to form as comprehensive an understanding of these monuments as possible.

The choice of the word ‘elite’ in the title is deliberate. The stones forming the basis of this study would almost certainly have been erected by, or for, the elites of Scotland at this time, rather than the common people, and therefore we may assume that their content will reflect the preoccupations and values of the elites. However, in this case the elites may be separated into the secular and religious. Church leaders, although possibly drawn from the same groups of people and benefiting from the same wealth, culture and connections, would have had different needs, desires and perspectives than their secular counterparts. There are several stones which feature exclusively ecclesiastical scenes, be they Bible stories or simple depictions of religious figures, as seen from their garments and accessories, without involvement of secular issues. Therefore, since these are more likely to have been erected by ecclesiasts, they have been excluded from this study. What remains is a series of stones featuring identifiable, secular scenes depicting human figures or horsemen, although interpretation of these is not necessarily easy.

Interpretation is based on two levels of understanding: iconography, identifying what it is we are seeing, and iconology, exploring the deeper, religious meaning of the icon (Alcock, 2003,

362). The first level is not always a simple matter, since the condition of the stone, an understanding of animal physiology and behaviour and the material culture in question each need to be taken into account. The second level may also present difficulties to modern researchers. Of the seventy-five monuments featuring secular humans, only one, the Dunkeld 2 stone, is a Class I; the remainder are Class II or Class III, and roughly date to the 7th-9th centuries AD (Alcock, 2003, 372). Since the defining feature of the Class II and III stones is their Christian imagery, Dunkeld 2 will not be included in this analysis in order to preserve a cohesive dataset. Given the presence of a cross or religious scenes on the remaining seventy-four monuments, these might be expected to have been produced by a Christian society. However, it is unlikely that 21st century researchers would be sufficiently well-versed in early Christian theology to identify many of the scenes that might be instantly recognisable to those who experienced the stones as part of their landscape. Bailey (1996, 3) points out that an eagle on the Minnigaf stone that modern researchers might identify as a symbol of St John the Evangelist is actually, on the basis of 8th Century Augustinian texts, more likely to be a symbol of Jesus Christ, and such images should be considered with an 'educated monastic eye'. It is therefore important to bear in mind that what might appear to be a simple hunting scene could have been intended as a representation of early Christian theology.

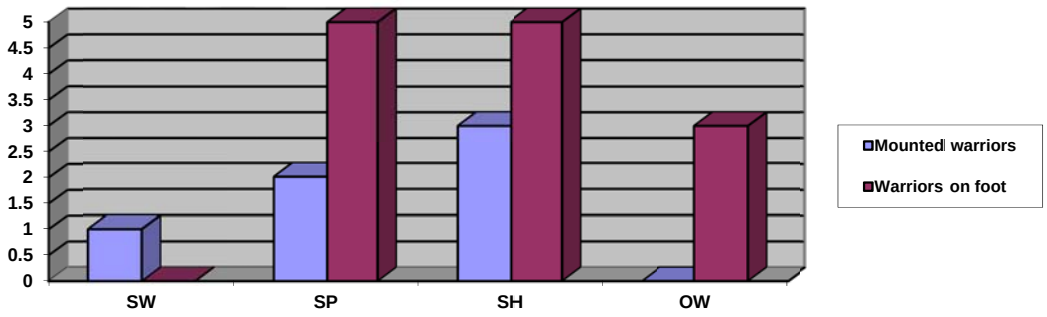
Results

Once the evidently ecclesiastical figures have been eliminated, a corpus of seventy-four illustrations of stones showing secular scenes are available in Allen & Anderson (1993). These were classified for analysis as follows:

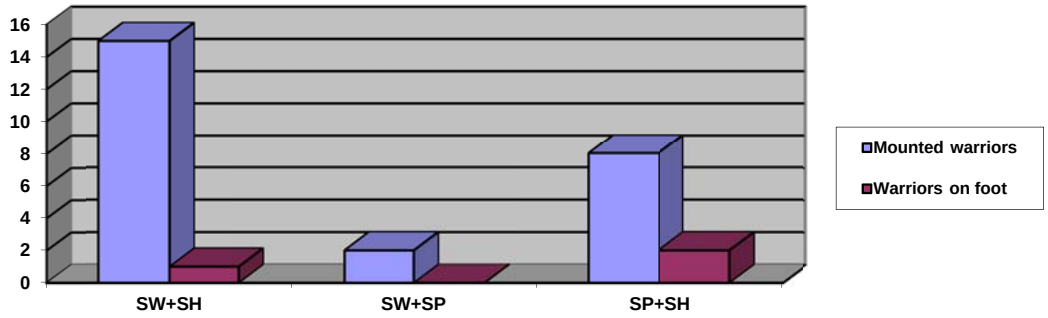
- Hunting Scenes
- War Scenes
- Complex Scenes

- Horsemen
- Armed Horsemen
- Incomplete Fragments

The first three categories fall into a subgroup, as they show multiple images depicting an event or action. The hunting scenes are those featuring men (and, on the Hilton of Cadboll stone, a woman), both on foot and horseback, with a combination of hounds and wild animals, usually deer. The war scenes are those that feature armed men, on foot or horseback, carrying a range of defensive or offensive weapons – those stones where the only weapon is a spear will not be included within this category as spears were also a principle hunting weapon. There are seventy-one entire, decipherable figures on Category 2 stones that carry a weapon or ride a horse and the panoply of each individual varies widely, including swords (SW), spears (SP), shields (SH), other weapons (OW). Twenty-two figures riding horses but carrying no weapons are included as warriors based on their hierarchical association with other figures carrying weapons.



(Fig.1: Frequency of warriors with one item)



(Fig.2: Frequency of warriors with two items)

Only two figures display the full panoply of horse, sword, spear and shield. This category always demonstrates some level of hierarchy between the figures, through their relative sizes, positioning or range of equipment carried. An example of such a hierarchy is to be found on the Dull slab, showing a horseman carrying shield and spear at the top with three figures on foot to the lower right carrying only shields. Occasionally these figures are also actually engaged in combat, as on the Aberlemno 2 and Sueno stones, providing an impression of the differing levels of command, skill and wealth within an armed force. Complex scenes are those that show multiple categories of activity. They may include hunting, combat and domestic scenes on the same slab. These tend to be difficult to interpret, as their arrangement gives no narrative clues as to the events depicted, or the reasons for their depiction.

The latter three categories contain images without any form of context, in that they do not depict specific activities or, where they show more than one figure, do not show any obvious form of relationship. The horsemen category shows riders (or more occasionally, men on foot), individually or in a group, without weapons, while the armed horsemen category depicts riders (or men on foot), individually or in a group, with weapons but without any indication of a hierarchical group. The incomplete fragments category includes those

fragments that show a proportion of one of the above categories, but are obviously part of a larger stone, portions of which are missing, making it impossible to accurately decide what the original depicted. The lack of context in these cases makes interpretation particularly hard as these partial images could be incorporated in their present state into categories 4 and 5. The table below shows the difference exclusion and inclusion of fragments makes to Horsemen and Armed Horsemen categories:

Categories	**No. of Stones**	**% Total Stones**	**No. of Stones incl. Incomplete Fragments**	**% Total Stones incl. Incomplete Fragments**
Hunting Scenes	17	23%	17	23%
War Scenes	10	13%	10	13%
Complex Scenes	9	12%	9	12%
Horsemen	8	11%	18	24%
Armed Horsemen	14	18%	20	28%
Incomplete Fragments	17	23%	----------	----------

(Fig.3: Table of Categories of Pictish Stones)

There is also a possibility that the missing segments held images that would place the fragments in one of the first three categories. This ambiguity led the fragment stones to be excluded from further analysis.

These divisions allow a basic analysis to be undertaken in order to provide an idea of proportions of themes. However, they are not unproblematic, particularly those categories found without context. Category 4 may depict ecclesiastical figures, since no weapons are found. Category 5 includes a large number of stones featuring single horsemen carrying a spear which cannot be included in Categories 1 or 2, since there are no animals or hierarchical groups present, but it is not unreasonable to suppose that the spear could be associated with hunting or conflict. It is issues such as these that highlight the need to study

these stones using a more sophisticated approach.

Traditionally, various aspects of the stones have been studied in isolation. Symbol function and meaning, material culture and cross styles are topics of previous works (Clark, forthcoming; Henderson & Henderson, 2004; Jackson, 1993) but rarely is a stone considered in its entirety. The components of its carving are not individual but form part of a coherent whole, if only we could grasp it. Therefore, the approach of dividing the stones into categories can only be a blunt tool, the start of a longer and more complicated process. In order to understand how the three themes of hunting, warfare and religion are connected, it is necessary to identify how many stones have references to multiple themes, or trans-themes. By their very nature, Class II and III stones depict Christian imagery in the form of a cross and so where hunting or warfare is depicted it is also automatically associated with religion. However, several stones seem to display images of all three themes. The manner in which these trans-themes are presented and their relative positioning may provide some insight into the extent to which these elitist preoccupations overlapped and whether any particular pattern can be deduced in relation to the dominance or pre-eminence given to one over the others.

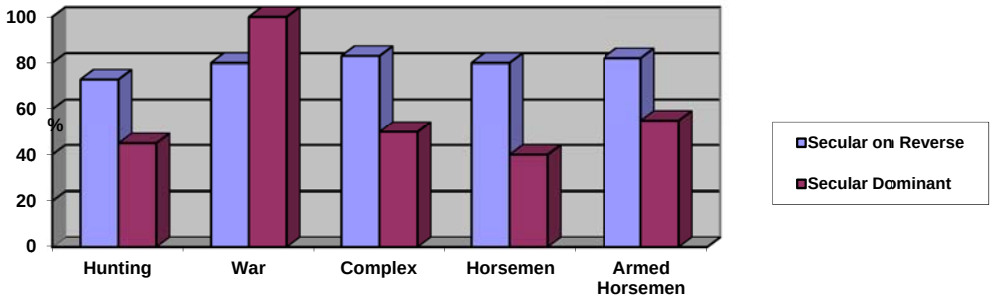
The number of trans-themed stones, depicting all three themes, will vary depending on the way categories have been classified. The classification of the hunting and warfare categories in this paper allow identification of seven at least partially trans-themed monuments. Three of the hunting scenes (found on the Tullibole, Meigle 11 and Mugdrum stones) bear relation to the warfare category as the positioning and size of the hunters suggest a hierarchy – a key feature of the warfare scenes. Three of the warfare scenes (on the Barochan, Dull, and Dupplin stones) contain a dog, while a fourth (the Menmuir 11 stone) shows what appears to be a beast, possibly a deer. Dogs and beasts are key components of hunting scenes, although

in the case of the first three, these may not be true trans-themes as it is possible that dogs were employed as a weapon during fighting.

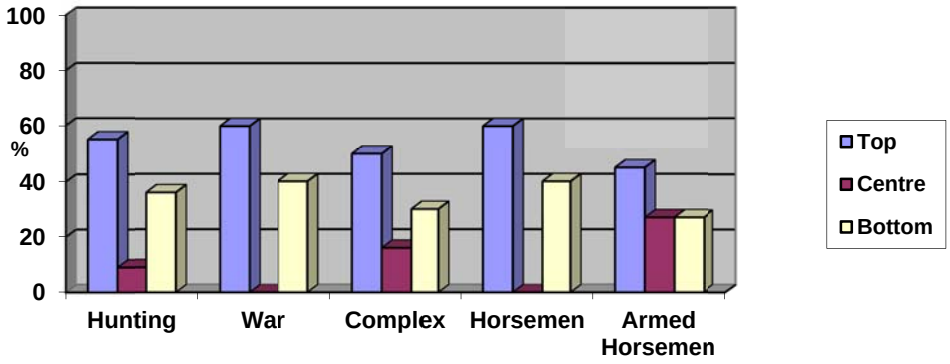
It would be possible to raise significantly the number of monuments counting as trans-themed were the classifications to be relaxed slightly, as the demarcation between the two categories is frequently artificial. Spears are a key feature of both categories and are often carried in the same position in hunting and war scenes. Some hunting scenes show hunters carrying a greater proportion of the warrior's panoply than just a spear, such as on the Inchbrayock 1 stone, and likewise, five war scenes show warriors carrying only a spear, including on two of the most famous 'warrior' stones – Dupplin and Aberlemno 2. It is not unreasonable to assume that hunting provided vital practice in the use of weapons that could also be employed in conflict. Further, the category of 'Armed Horseman' could be taken a step further; most of the weapons in this category are spears and the presence of a multi-purpose weapon without any other form of context may be deliberately ambiguous. It may be intentionally meant to evoke the pursuits of hunting and warfare at the same time, proclaiming that the figure depicted was a generally skilled, talented and elite individual – division between hunting and warfare in this context would be pointless. Although there are monuments that are clearly dominated by their reference to warfare, such as Sueno's stone, or to hunting, such as the Hilton of Cadboll stone, it is also clear that drawing an automatic distinction between the two categories will not always be appropriate.

The relative positioning of different features within each stone is crucial to understanding the relationships between particular themes. In all but two cases, the religious imagery was dominant (where it covers more than 80% of at least one side of the monument), reflecting the monuments' essentially religious nature. Where a cross has been carved, this is referred to

as the front of the stone, and frequently the secular scenes are to be found on the reverse face. A secular figure will be described as dominant if it is the only image, if it is larger than the other images, or if it forms a scene which covers a large portion of one side of the stone. Where the figure is smaller than other images, or is one figure surrounded by multiple other images of at least the same size, it is not considered to be dominant.



(Fig.4: Chart showing location of anthropomorphic figures and their dominance)



(Fig.5: Chart showing positioning of anthropomorphic figures on stones)

The majority of stones, around 80%, separate the secular and religious aspects of carving onto different sides of the stones, suggesting that while the themes are directly linked they also represent separate spheres of conception. This holds true quite evenly across the five different categories, as does the level of dominance of anthropomorphic figures at around

50%. The secular scenes are clearly of some importance but not to the exclusion of other features, such as abstract symbols and decorative knotwork. It is worth noting that where the human element is not the main image, it is frequently pairs of symbols, such as the double disk and Z-rod, which dominate. Doubtless this has some significance, but much has already been speculated as to the meaning of the symbols (Clarke, forthcoming; Jackson, 1993) and there is nothing further that may be helpfully added here. The one exception to the general positioning of secular figures are those found in war scenes, where dominance rises to 100%. The majority of the secular features tend to be placed at the top, with the remainder split between those positioned in the centre and those at the bottom (although the latter is more common).

Discussion

It could be argued that where a stone shows religious imagery on one side and secular scenes on the other, the two were carved at different times, indicating that the images had no direct and specific association with each other. Had the abstract symbols held some crucial religious significance, it is not unfeasible to suggest that the subsequent imposition of a Christian cross, appropriating 'pagan' space, would have been a key element in consolidating the conversion of the people of Early Historic Scotland. However, their very shape makes this unlikely. Two, at Barochan and Dupplin, are entirely carved into the shape of a cross with secular scenes depicted within panels. The vast majority of the others, like Aberlemno 2, seem shaped specifically to fit the cross they contain or at least to be dressed and shaped into a roughly symmetrical form in a way that Class I stones are not, indicating that the cross was the first feature carved – or was at least the dominant feature in mind when the stone was being prepared. If both sides are contemporary and the cross was carved first, the inclusion of pre-Christian symbols may indicate a desire by the Christian instigators of the monuments to

include symbols with a long history of meaning to the peoples of Scotland. It may also indicate a level of practical accommodation between the pagan and Christian traditions, a theory supported by descriptions of the approach of Church leaders to warfare provided by literary sources (Bede, *HE*). If we accept that the two sides were created contemporaneously, it raises questions as to why particular themes were paired together and whether any patterning appears.

The combination of significant proportions of the stones displaying dominant anthropomorphic themes and the placement of these themes at the top of the stones, suggests that, in general, these may have more importance for those who made and experienced the stones than the other, non-religious elements shown.

Whether the Christian nature of the monuments is a representation of deeply held beliefs, or a product of convention or political necessity, is unclear. However, it does strongly imply the dominance and involvement of religion in other aspects of elite society, at least symbolically, and inferences may be drawn regarding the central practical and political role of the church in everyday life. The dominant placing of all war scenes suggests a significant cultural importance attached to warfare, albeit on a minority of stones. There are numerous examples of cultures across the world conferring preferred status on those considered to be the most successful of warriors. If, as the nature and positioning of the war scenes suggest, elite societies in Scotland also celebrated military achievement in this way it seems likely that these images represent a shared sense of identity and self-worth. Alternatively, it is possible that all the monuments were created with differing intentions and functions in mind. Perhaps those showing dominant scenes of warfare were intended to commemorate an event or particular aspect of an individual's life, as opposed to making a general statement of belief,

status or loyalty, although such possibilities can only remain conjecture at this point.

The representation of warriors is also somewhat revealing about the arrangement of Early Historic Scottish societies and the way in which conflicts were conducted. Firstly, the monuments illustrate a clear demarcation between the elite figures, with all the trappings of wealth and privilege – a war horse and full panoply of weapons – and the vast majority of those who might also be involved in a conflict, poorer and less well-equipped foot soldiers. Horses and cavalry did not seem to form a significant part of armies or war parties, which is perhaps to be expected in societies where the hierarchical arrangements are so steeply pyramidal. Efficient utilisation of a well-trained war horse would have involved expenses and training out of the reach of all but the wealthiest (Hughson, 1991). Instead, those who could afford more than the absolute minimum of one weapon, tended to carry either a shield and sword or shield and spear. Effective use of shields, and particularly swords, requires at least some degree of experience, suggesting that military practice was sufficiently important for significant sections of the male population to undergo some level of training. Finally, although general conclusions can be drawn here, it is important to note that attitudes to, and methods of conducting, conflict might have varied significantly across Scotland during this period.

The finding that Christianity was an important and all-pervasive aspect of Early Historic Scottish society, and that warfare was a crucial activity in the life of the male elites, is borne out by literary sources of the time, which also explicitly link the two. The 5th-9th centuries AD were a time of massive upheaval, with major power struggles taking place across the territory of modern Scotland, in both the religious and secular arenas. However, the literary sources of the time (Anderson & Anderson, 1991; Bede, *HE*; Koch, 1997) make it clear that the

religious and secular during this period were interdependent.

The relationship between Christian Church leaders and kings is described explicitly by early writers and is extremely interesting. Warfare and raiding were an integral part of society across Britain at this time and the financial incentives were crucial in maintaining a king's power base and keeping the economy of his kingdom healthy (Aitchison, 2003, 136). Church leaders needed to find a way to allow individuals to convert but continue to take part in this activity; the compromise they developed was the 'Just War' (Alcock, 2003, 80). This stipulated that a Bishop could provide his king with a dispensation to go to war, with no spiritual repercussions, if the war was defensive or would free a kingdom from heathen raids, would lead to the conversion of a kingdom or if the enemy were Christian but celebrated Easter on the wrong date. Interestingly, the importance of the concept of a Just War and schisms within the early church demonstrably had more influence on early writers than the 'moral' divisions between pagans and Christians. In his *Ecclesiastical History*, Bede rather gloatingly recounts how during the 7th Century a heathen king, Aethelfrith, slaughtered twelve hundred monks praying for victory for the other side – the massacre of Christians by a heathen was acceptable because the monks in question celebrated Easter on the wrong date (Bede, *HE*, 140). Such a system conferred great power on the Bishops, given that kings were dependent on their Bishop's goodwill to maintain their own status. It was also financially beneficial to the Bishops, as grateful kings gave them a proportion of the proceeds of authorized raids and wars. Specific examples of such generosity are to be found south of the border: Reculver fort in Kent and Burgh castle in Norfolk were both given to the early Church by kings in return for prayers for victory (Alcock, 1987, 94). Over a short span of time, Church leaders began to accrue large amounts influence, power and money.

The accumulation of political *and* spiritual power was also occurring in the ostensibly secular arena, as kings and war leaders began to attract reverence bordering on the religious. Military success was paramount in society at this time and this is reflected in art, poetry and law. The hierarchical arrangement of the various strata of society shown on the Dupplin cross has been interpreted as a reflection of the almost divine status of kings (Alcock, 2003, 392); the *Y Goddodin* 'immortalises' its warriors in song and emphasizes the virtues of heroic warriors (Koch, 1997); Dal Riatan law stated that a new king was required to consolidate his position by leading a successful cattle raid to provide a feast for his coronation (Alcock, 2003, 119). In all these instances, kingly leadership and military success are explicitly linked and both are revered to a very high degree.

Conclusions

Although secular scenes are only found on a relatively small proportion of monuments, this small group is particularly illuminating when looked at in detail. These stones, although essentially religious monuments, make some reference to the secular experience in Early Historic Scotland, and many indicate a preoccupation with hunting or warfare. In addition, several may indicate both at the same time. Examination of the frequency of combinations and arrangement of the images on the monuments reveals religion to be a dominant preoccupation of Early Historic Scotland, as was warfare, although warfare and hunting are themselves not necessarily separate activities. The overlap between the two, both in terms of the skills and weapons involved, and the possibility that both were an integral aspect of the lives and self-perceptions of the elites of this period make strict division of these activities unrealistic. Christian imagery is always represented, and the strong economic and cultural ties to be found between religion and other aspects of elite lifestyle is borne out through other sources.

The approach employed here of examining frequency and positioning of particular categories provides a starting point for examination of the anthropomorphic, secular aspects of the stones. However, it also has definite limitations and remains a rather blunt tool with which to consider the themes depicted on the stones. An alternative approach which does not rely on initial, clumsy attempts to separate the stones into categories, could incorporate a more sophisticated method of analysing relative positioning and draw on existing bodies of knowledge regarding abstract symbols, theology and art history, which might result in a far more nuanced picture of the lifestyle of the elites of Early Historic Scotland.

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Appendix 6: Pictish Stones Referencing Warfare

Stone	Eastings/Northings	Comments
Aberlemno 2	352230/755550	Battle scene consisting of three rows of infantry and horsemen
Barochan	248500/663800	One panel with infantry spearmen with horns, 1 panel with man on horseback with spear, man with horn, man with axe, two other figures and two beasts
Benvie	332830/731450	Two mounted horsemen with spears, swords and shields
Drainie 8	322300/869600	Fragment showing man holding spear and shield
Dull	280600/749200	Fragment with two mounted men, both with spears and at least one with shield, 2 dogs, 3 other figures, three men with shields
Dunblane	278170/701390	Mounted horseman with spear
Dunkeld 1	302370/742590	Mounted man with horn and spear
Dupplin	301810/714390	Mounted man with spear, two infantry with spear and shield, four infantry with spear and smaller shields
Eassie	335260/747450	Man on shield with spear and shield
Edderton	271900/884200	Man on horse, one horseman below with sword, spear and shield and one with spear and shield
Fordoun	372610/778410	Three men on horses with spears
Forteviot 4	305140/717470	Man on horse with spear
Glamis 2	338600/746880	Two men fighting with axes
Golspie	279930/898700	Man holding axe and knife
Inchbrayock 1	370930/756750	Man on horse with shield, spear and sword, man with sword and possible billhook attacking another figure
Inchbrayock 2	370930/756750	Man on horse with sword and shield
Kirriemuir 2	338950/754480	Two men on horses with spears, one hunting
Kirriemuir 3	338950/754480	Man on horse with spear, shield and sword
Logierait	296790/752010	Man on horse with spear

Meigle 2	328720/744590	Man on horse with spear
Meigle 3	328720/744590	Man on horse with spear and sword
Meigle 4	328720/744590	Man on horse with sword and spear
Meigle 6	328720/744590	Man on horse with shield and sword
Menmuir 1	353420/764360	Two men on horses, one with shield and one with shield, sword and spear
Newton of Collessie	329270/713240	Man with shield and spear
Rossie Priory	329210/730720	Five men on horses, one with spear
Rothesay 2	208620/663670	Man on horse with spear
Shandwick	285550/874710	Man on horse with spear, two men fighting with swords and square shields, hunting scene
St Blane's 2	209490/653440	Man on horse with spear
St Blane's 6	209490/653440	Man on foot with spear, shield and sword
Sueno's Stone	304650/859530	Five panels depicting a series of military events, including men on foot and horseback and a number of headless corpses

Figures

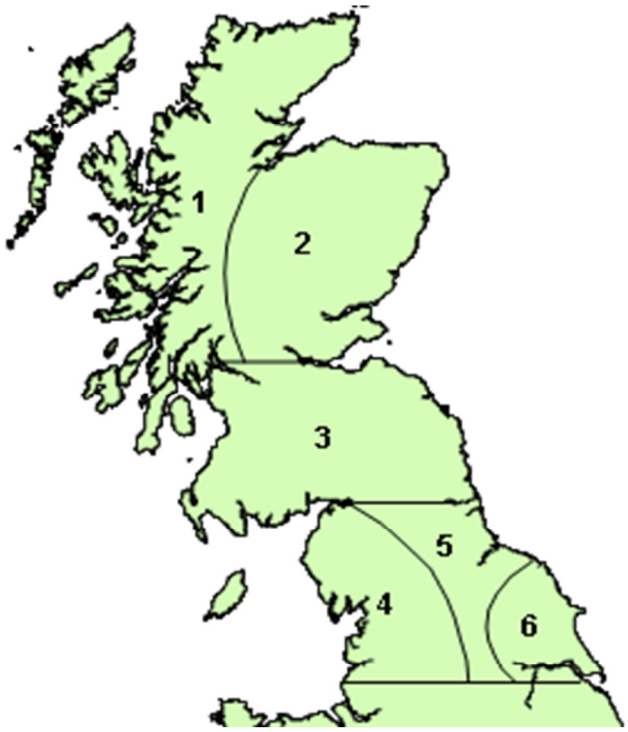

Figure 1: Regions within northern Britain

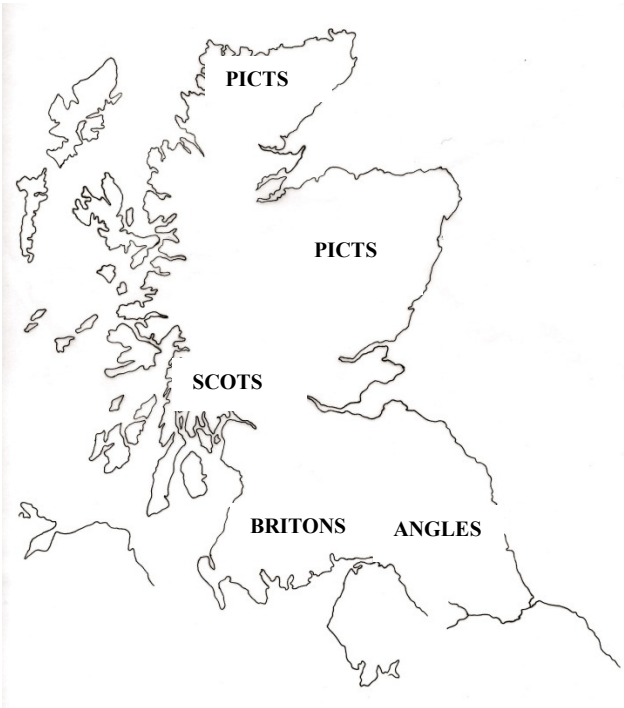

Figure 2: cultural groups of EHP northern Britain

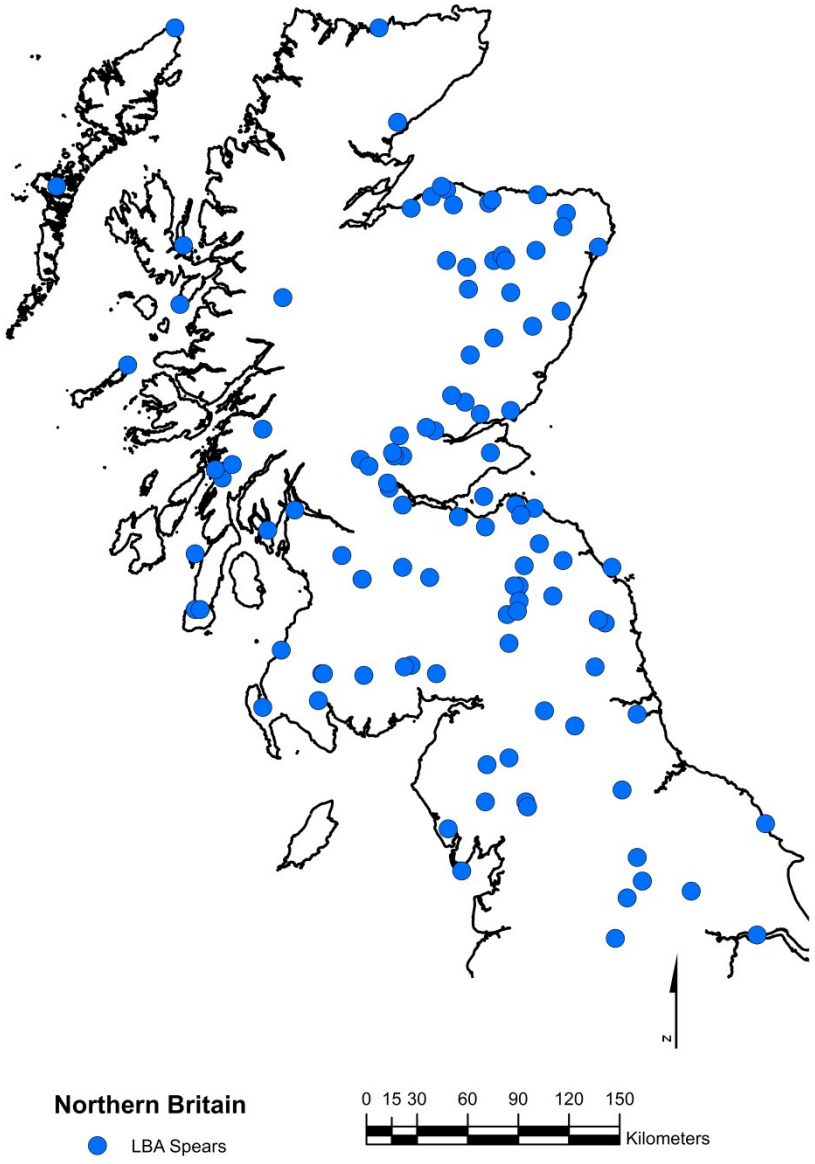

Figure 3: LBA spear distribution in northern Britain

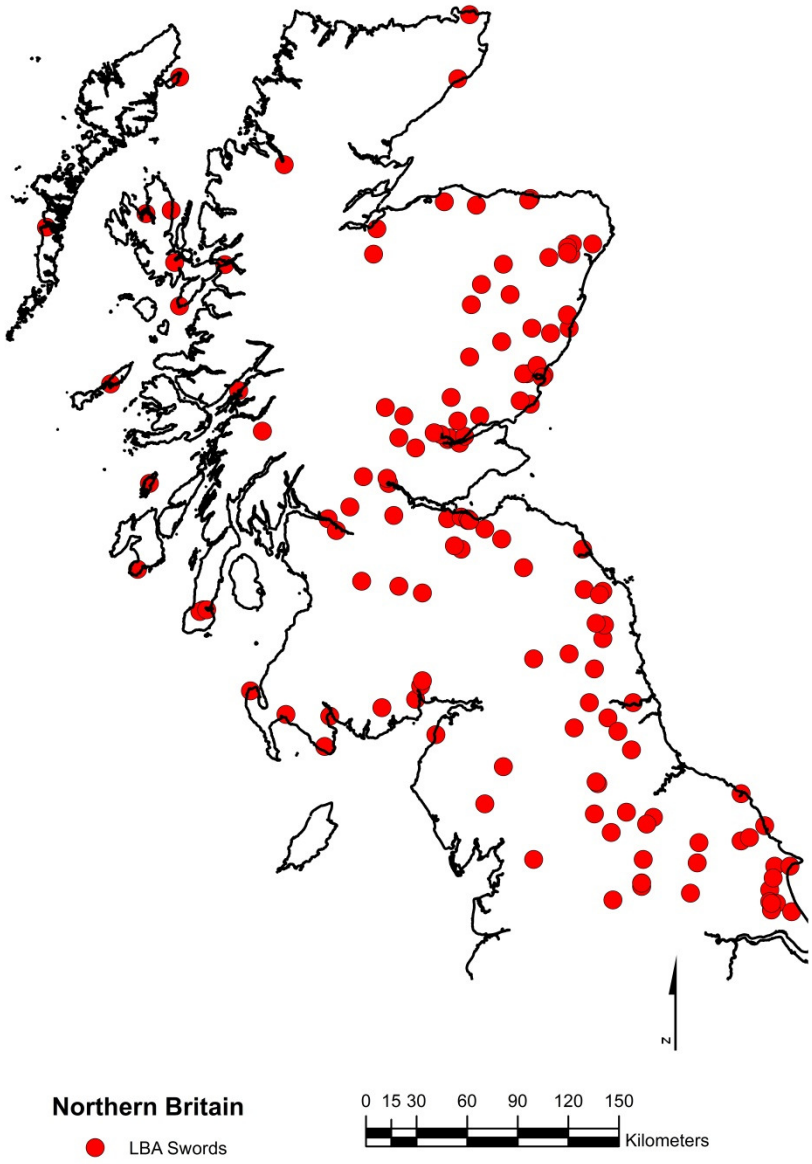

Figure 4: LBA sword distribution in northern Britain

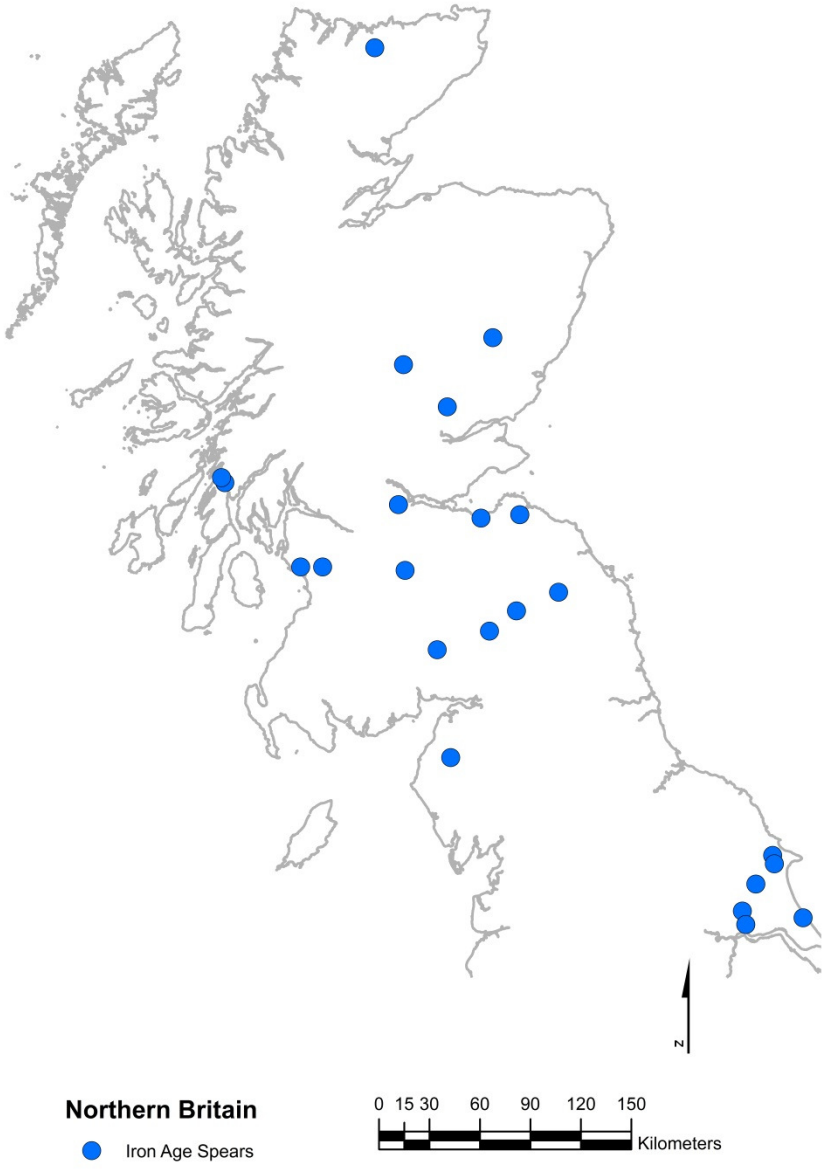

Figure 5: IA spear distribution in northern Britain

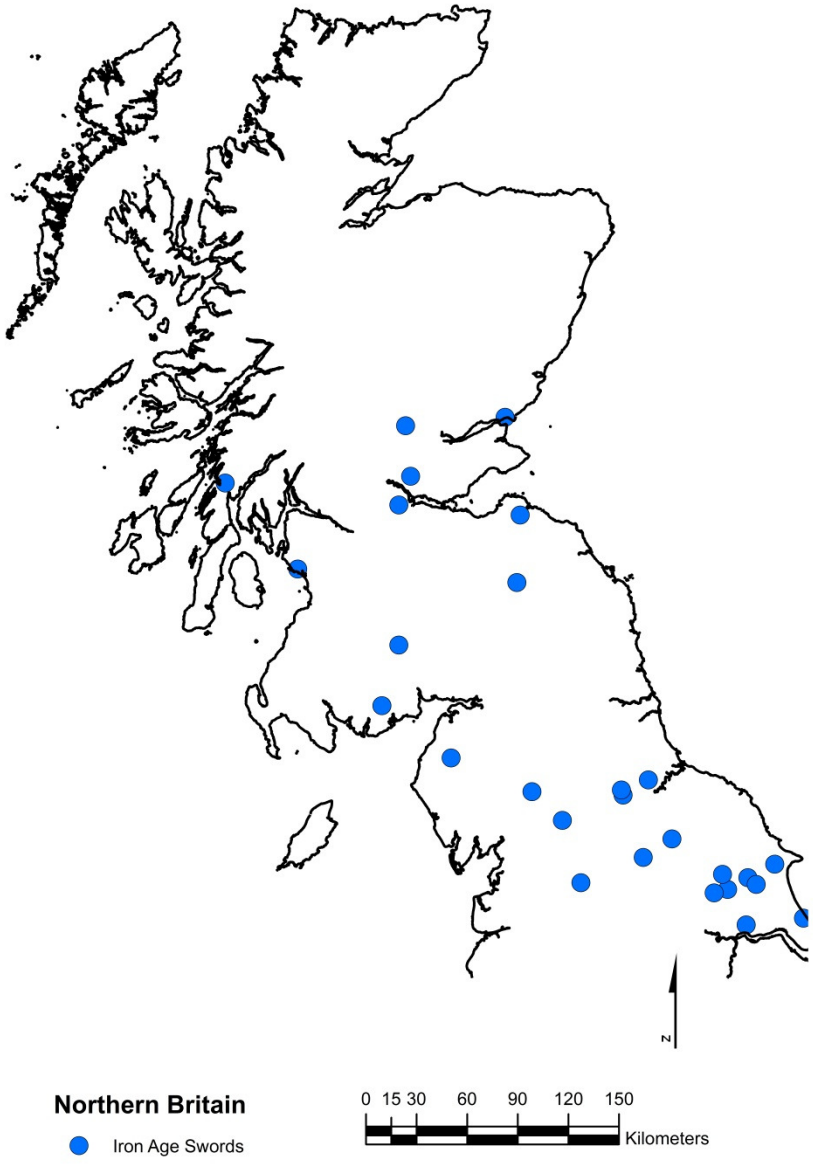

Figure 6: IA sword distribution in northern Britain

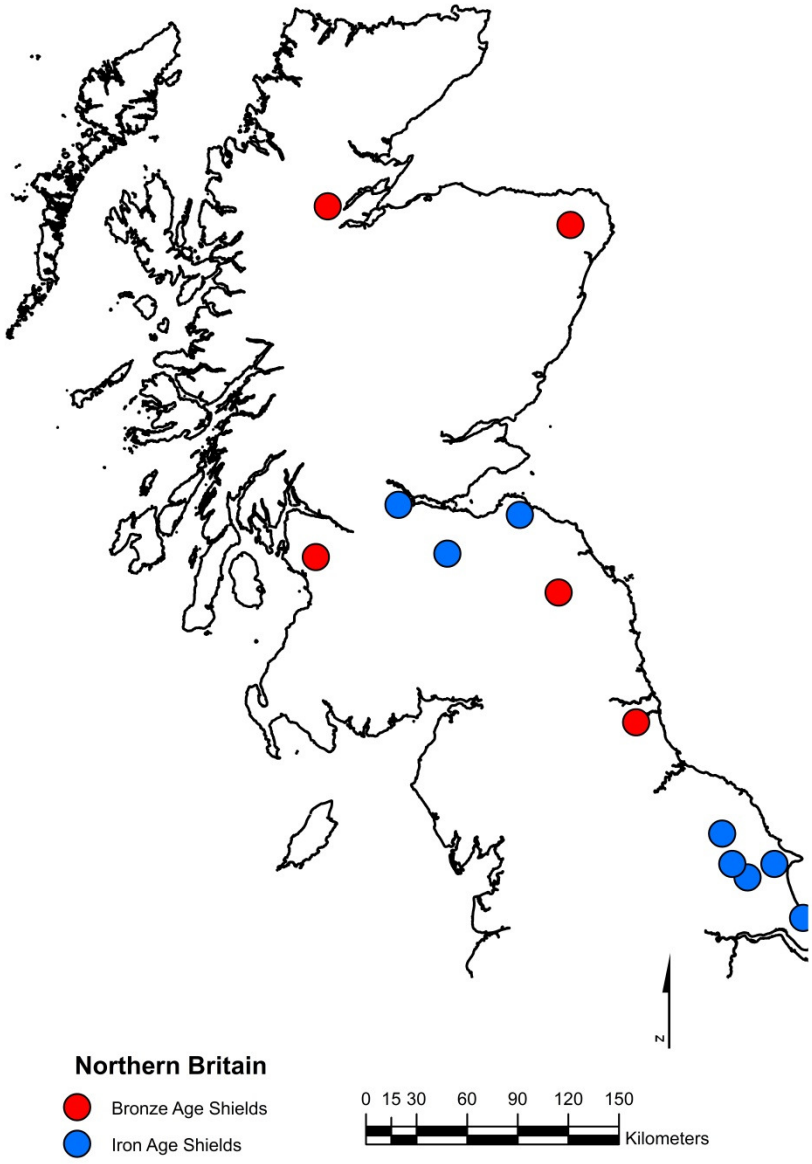

Figure 7: LBA and IA shield distribution in northern Britain

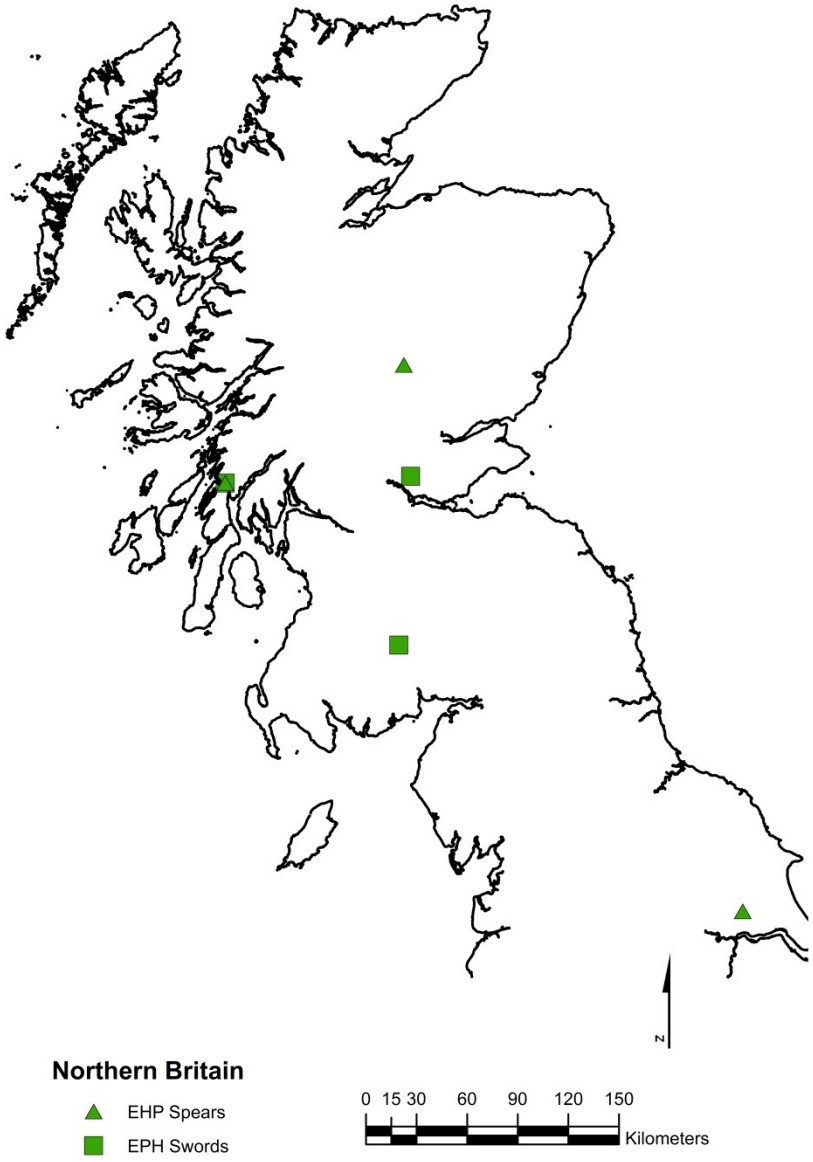

Figure 8: EHP weapon distribution in northern Britain

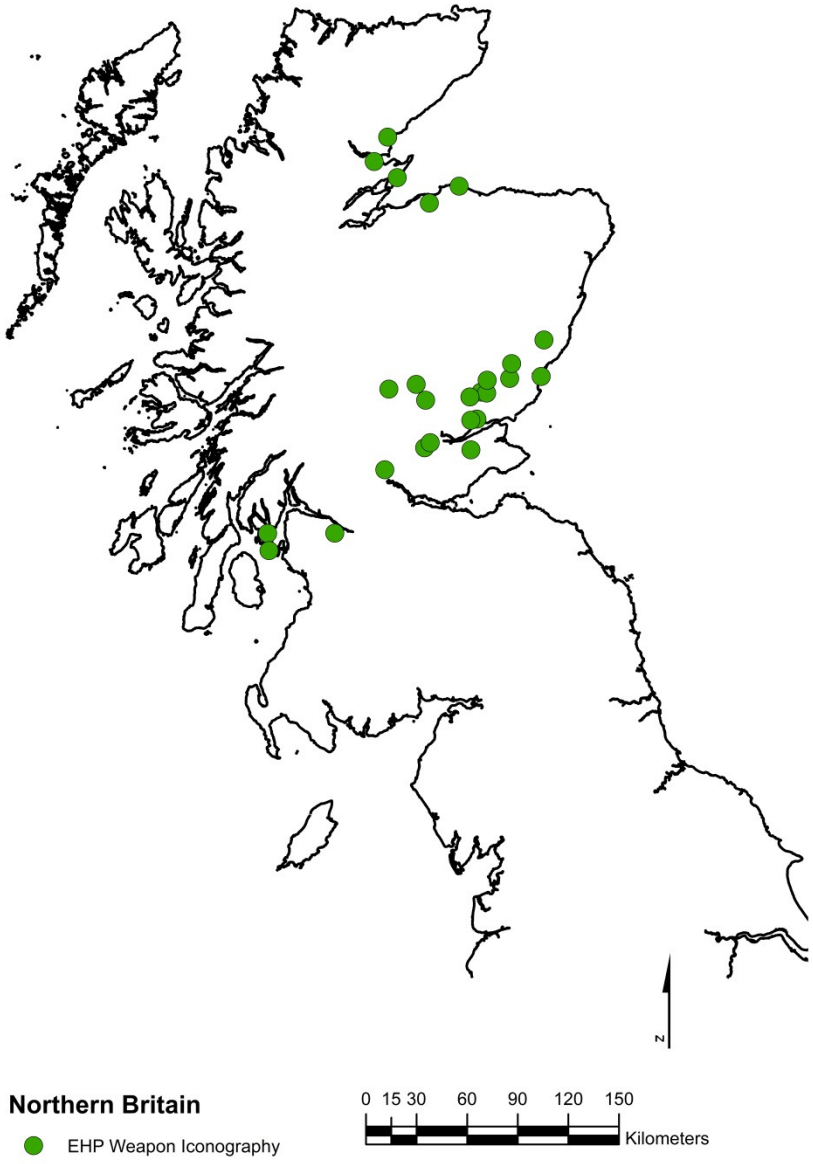

Figure 9: Distribution of EHP sculpture which represents warriors

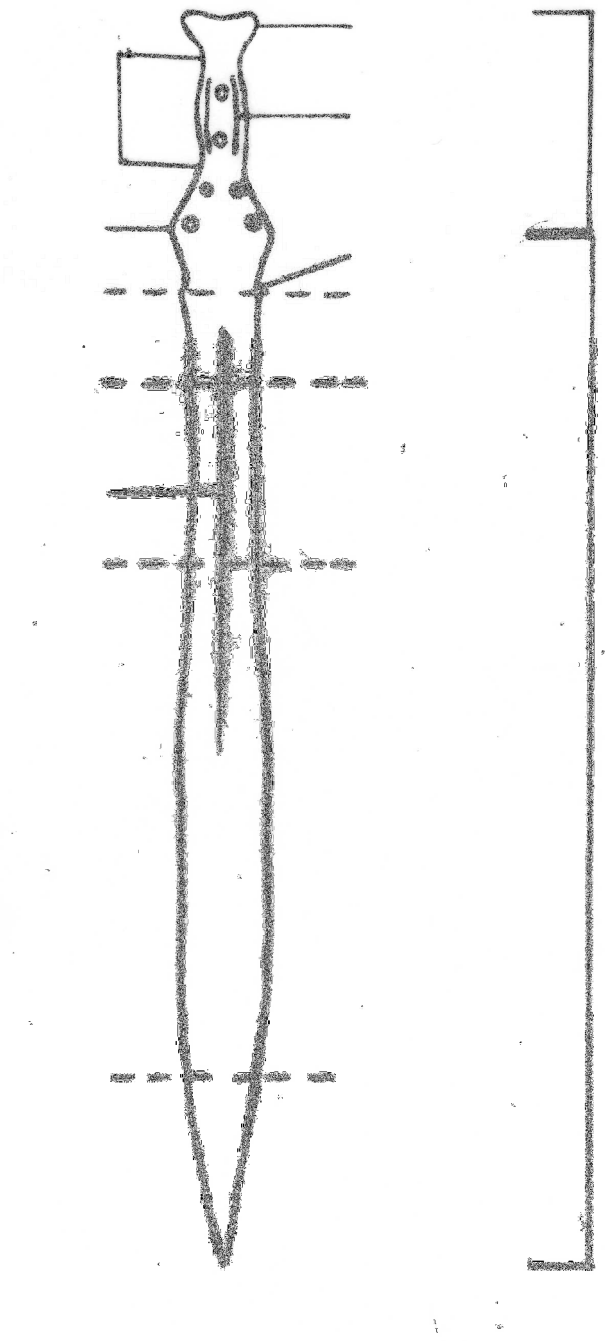

Figure 10: LBA sword features

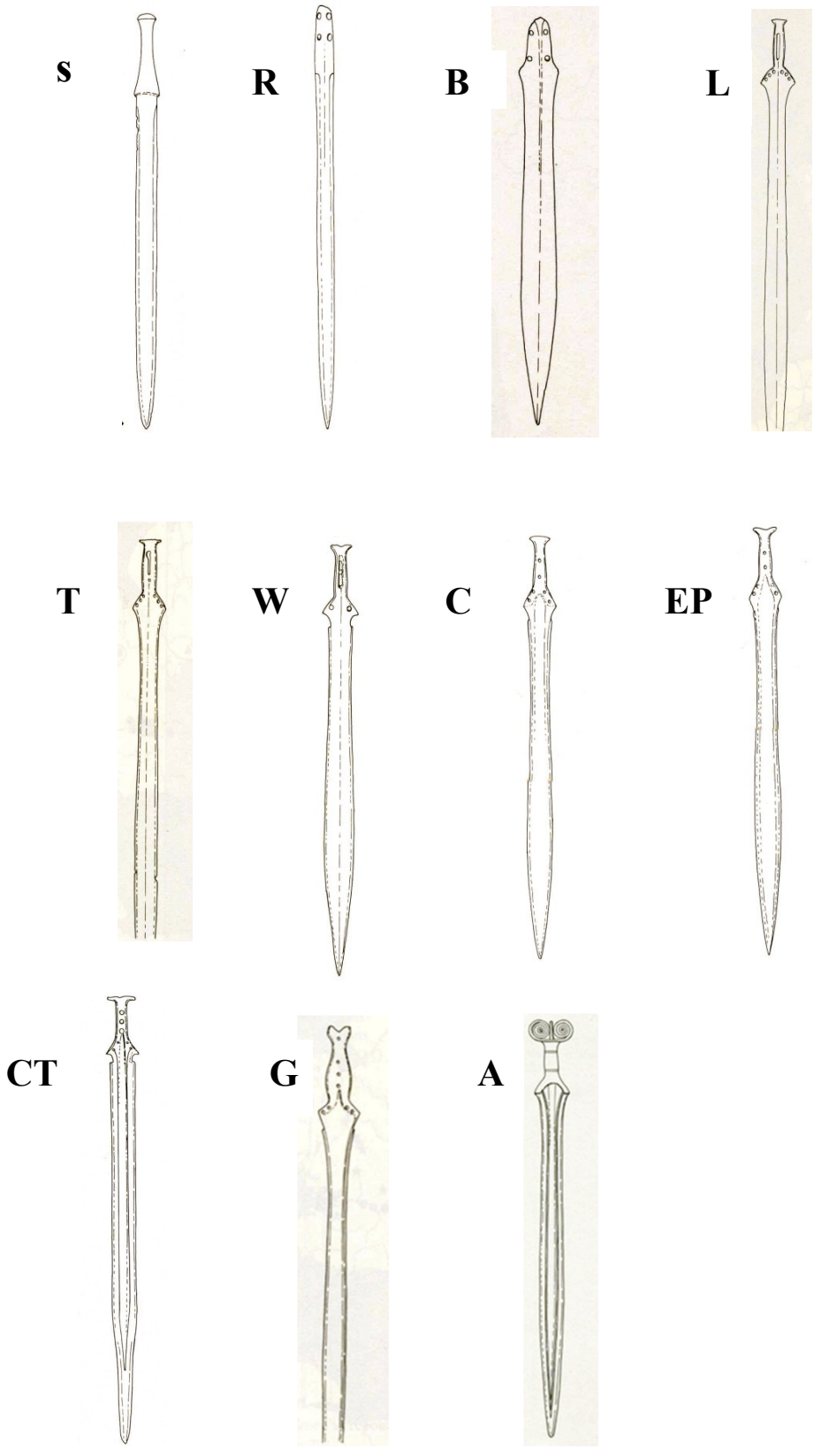

Figure 11: LBA sword typology of northern Britain (after Colquhoun & Burgess, 1988)

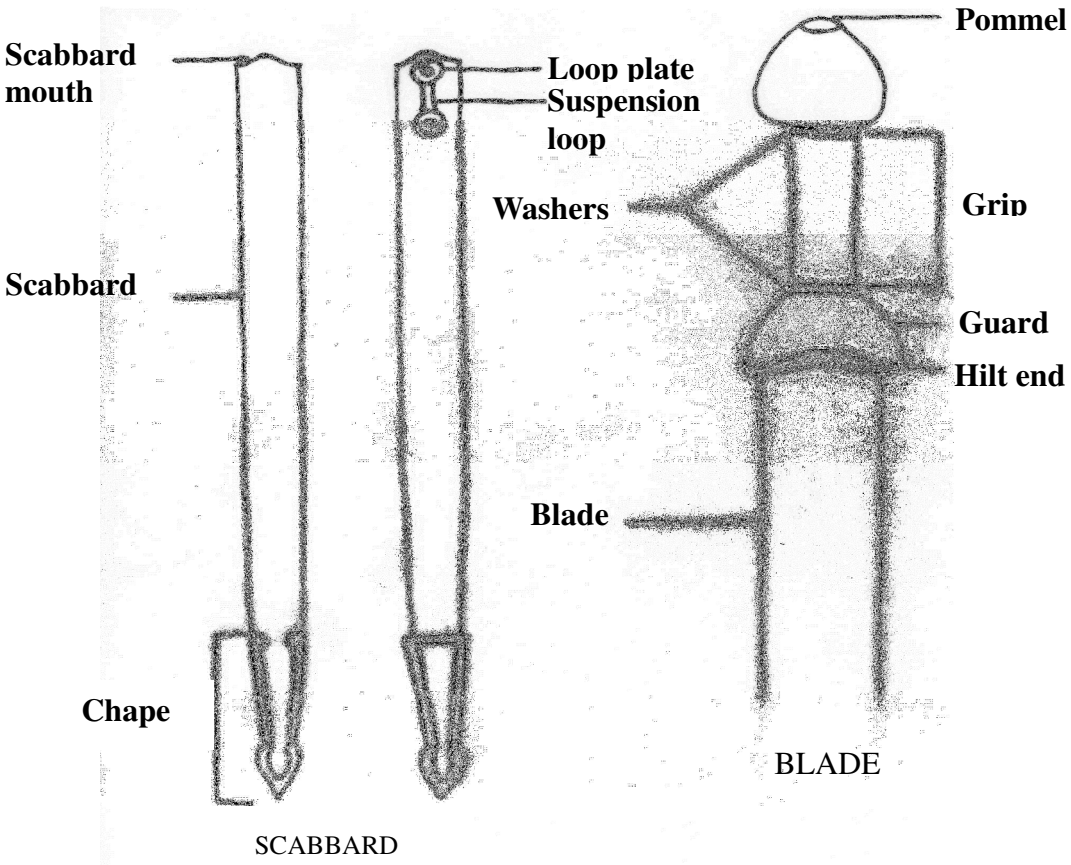

Figure 12: IA sword and scabbard features (after Stead, 2006: 9)

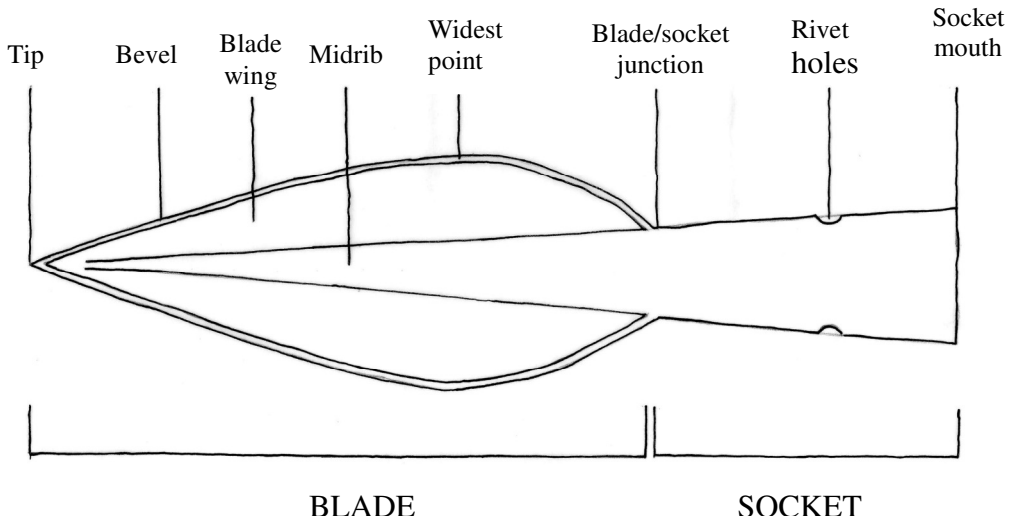

Figure 13: Spearhead features

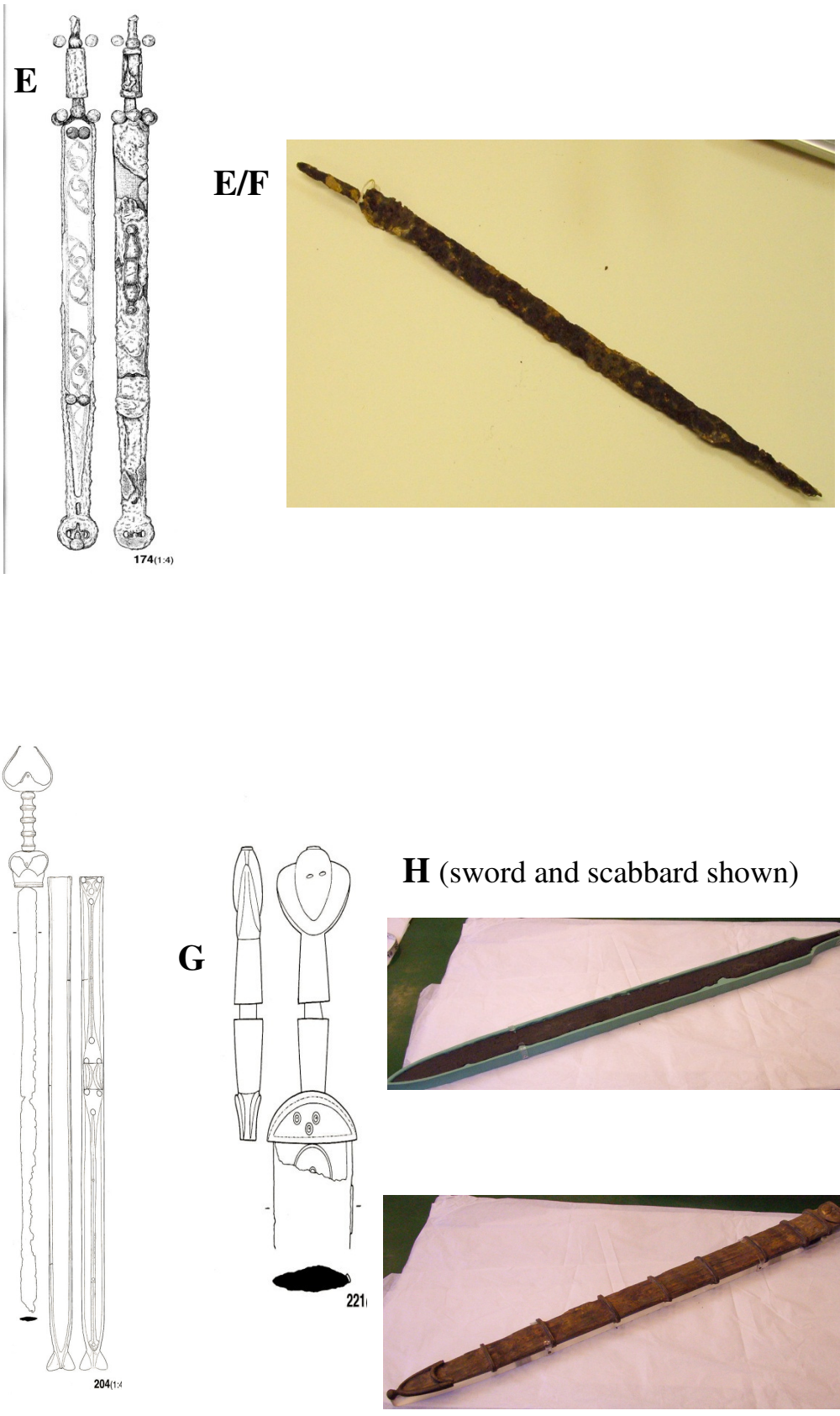

Figure 14: IA sword typology of northern Britain (types E, F and G after Stead, 2006)

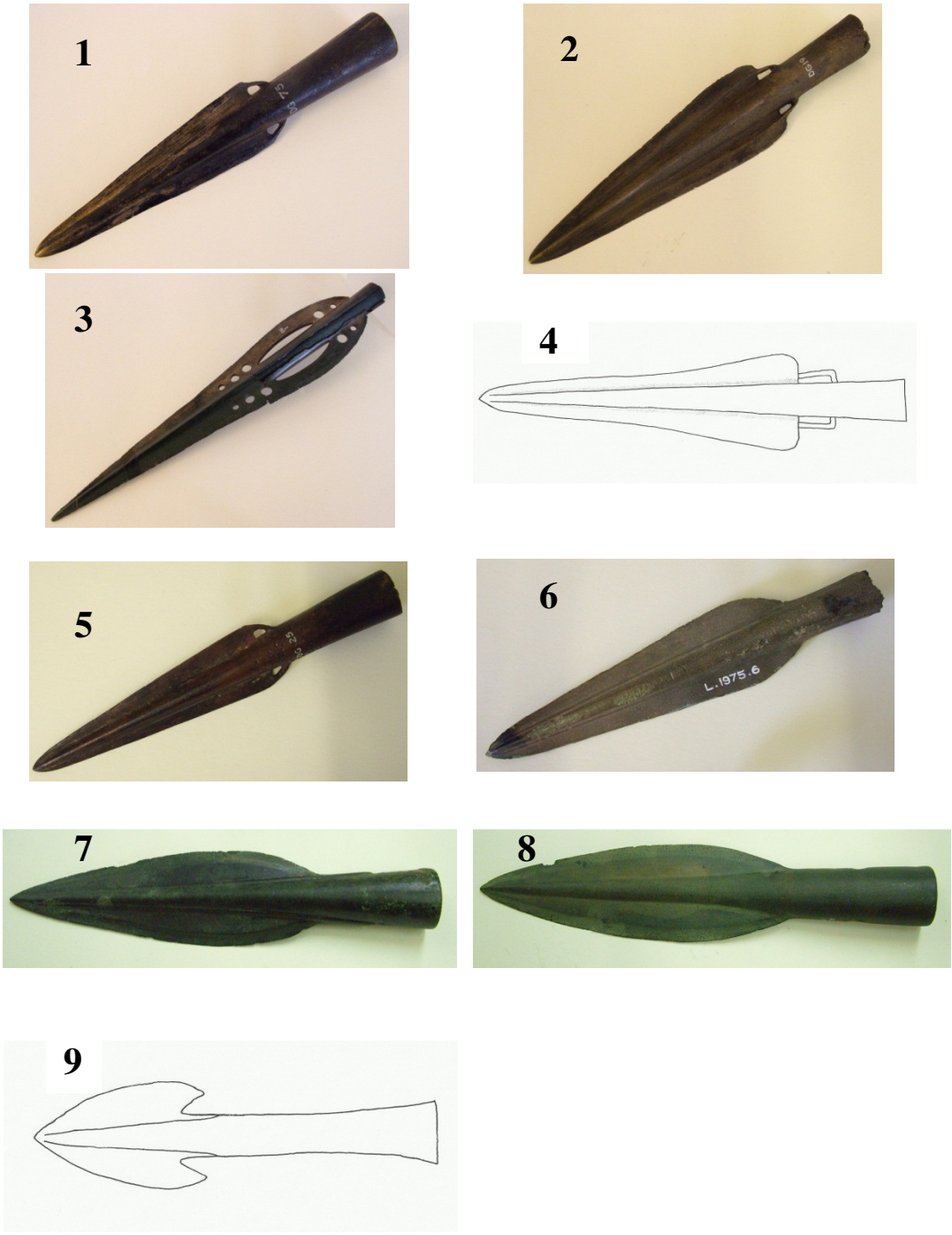

Figure 15: LBA spearhead typology of northern Britain

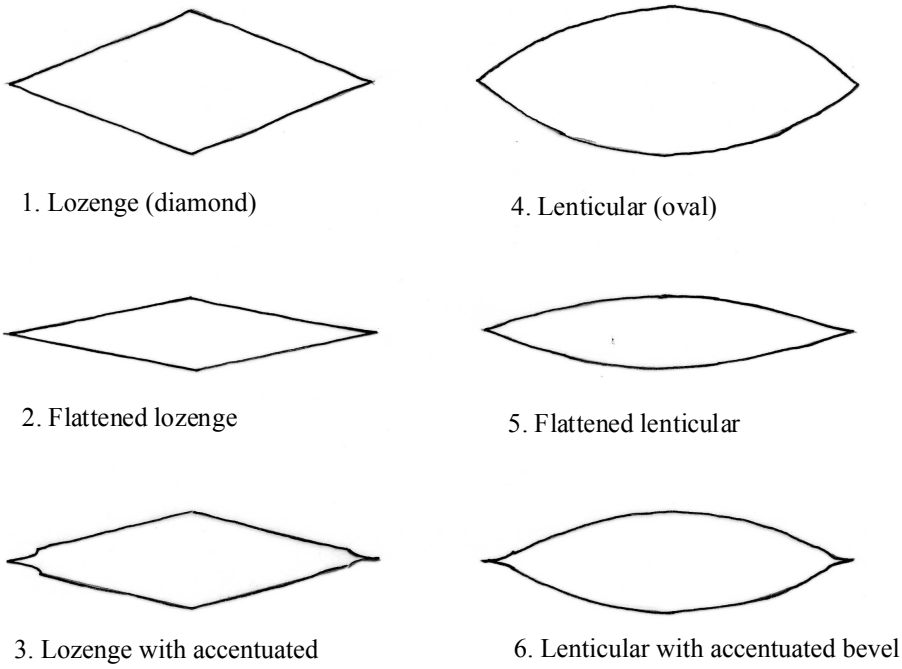

Figure 16: Section shapes

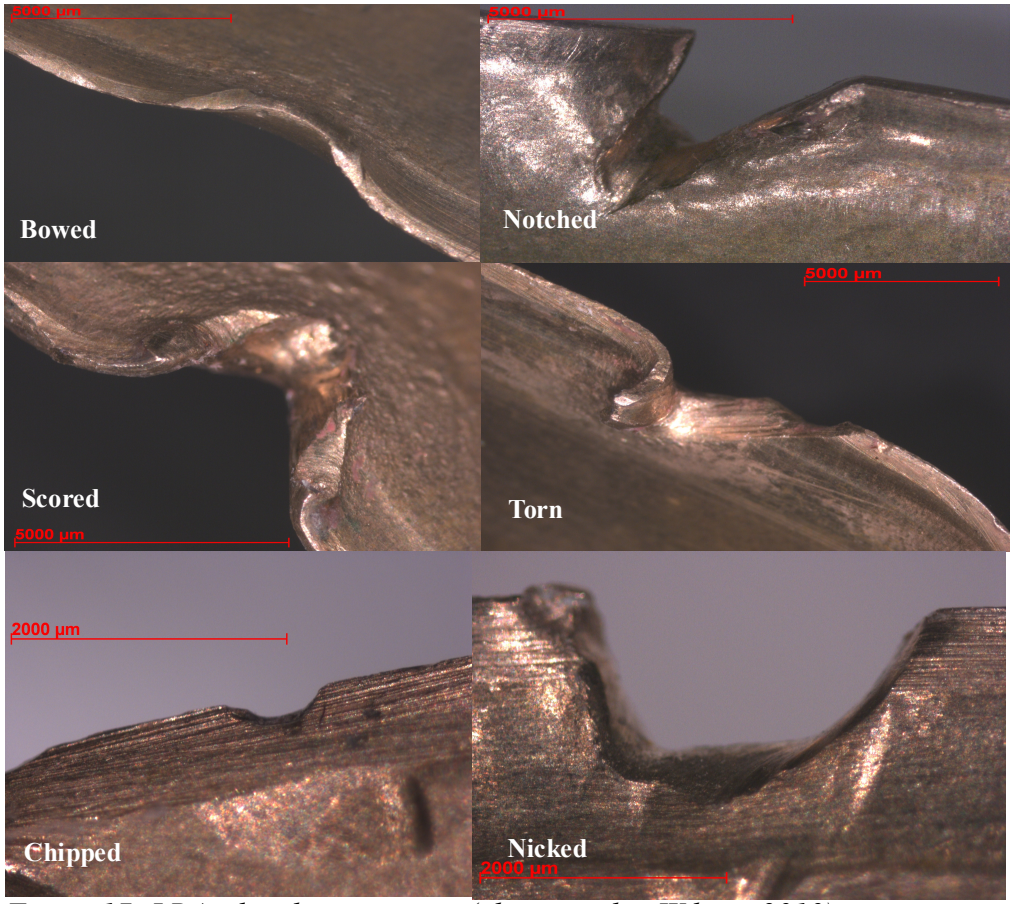

Figure 17: LBA edge damage types (photographs: Wilson, 2010)

Figure 18: LBA edge hardening

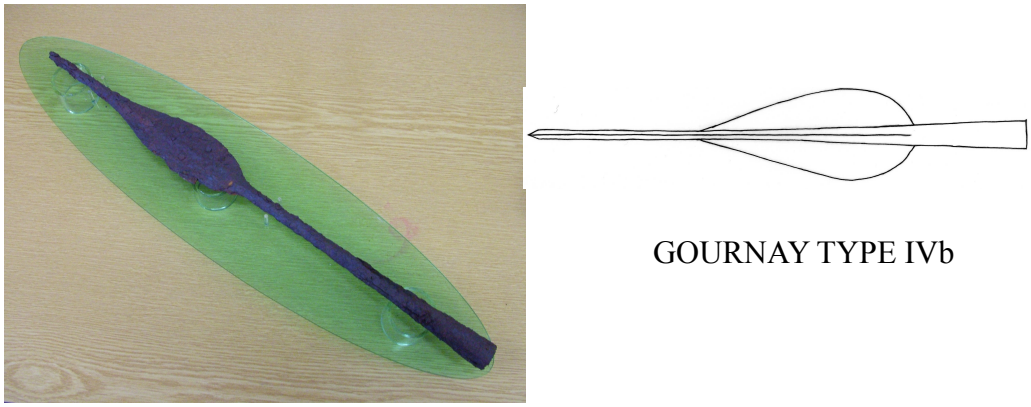

Figure 19: Comparison of ISP183 (left) and Gournay type IVb

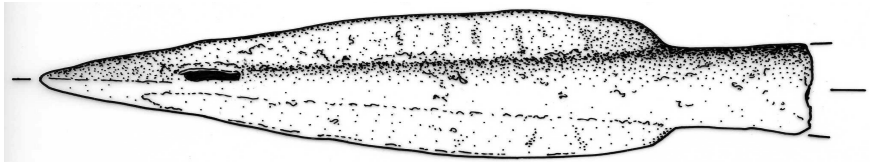

Figure 20: BSP215

Figure 21: BSW233

Figure 22: SH15

Figure 23: The Clonbrin shield (copyright National Museum of Dublin)

Figure 24: Experimental combatants wearing body armour

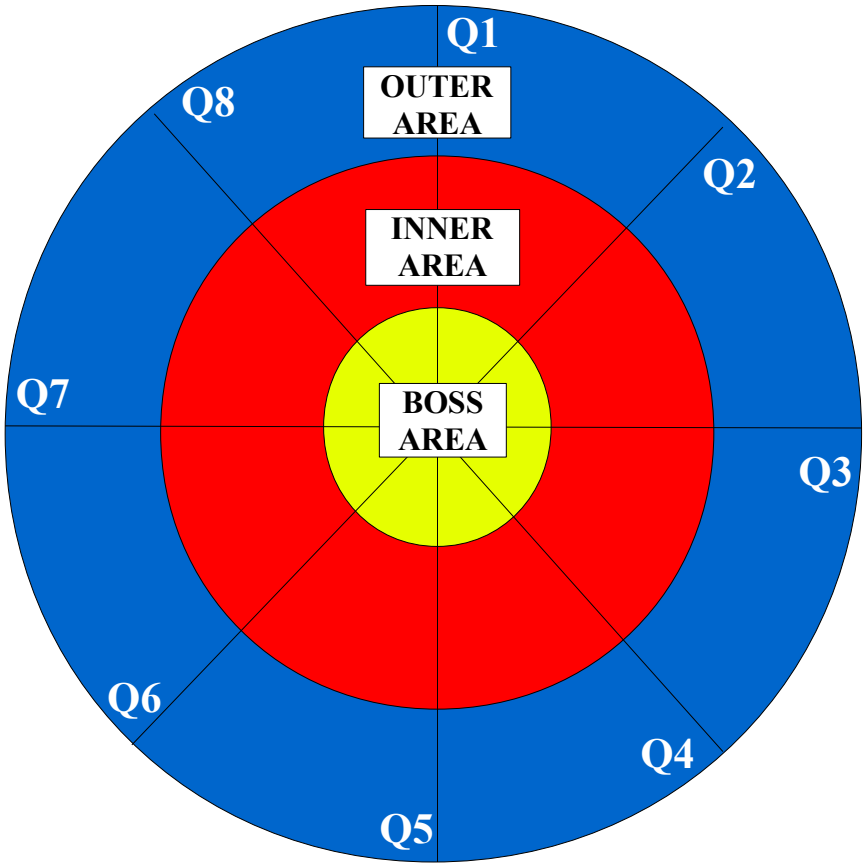

Figure 25: Shield face quadrants and areas

Figure 26: Jagged ends of broken spearshafts

Figure 27: Trauma caused by LBA sword strikes to pig carcass

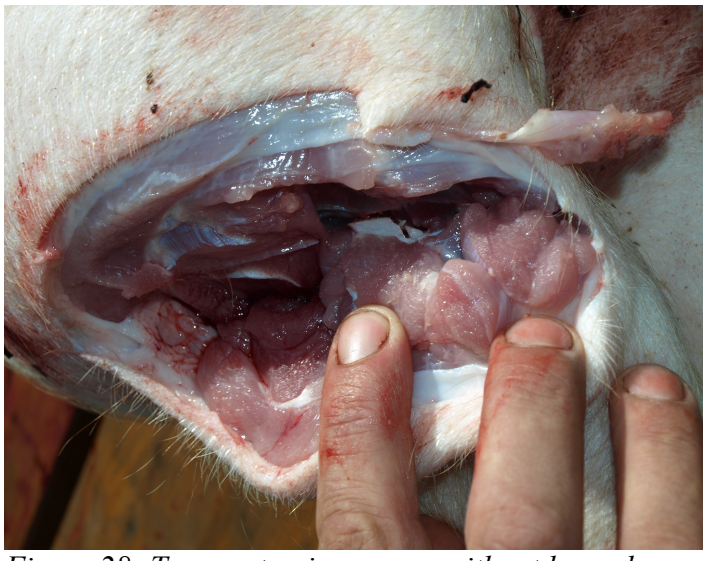

Figure 28: Trauma to pig carcass without bone damage

Figure 29: Damage to experimental spearheads (top, L-R: formal strikes; bottom, L-R: informal strikes)

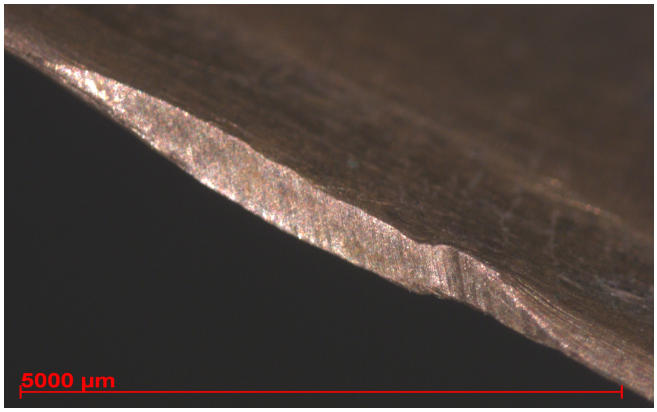

Figure 30: Flattening damage (photograph: Wilson, 2010)

Figure 31: Damage to the River Thames shield (copyright British Museum)

Figure 32: Damage to leather and metal shields from thrown spears

Figure 33: Damage to metal shield boss

Figure 34: Flexibility of damaged leather shield

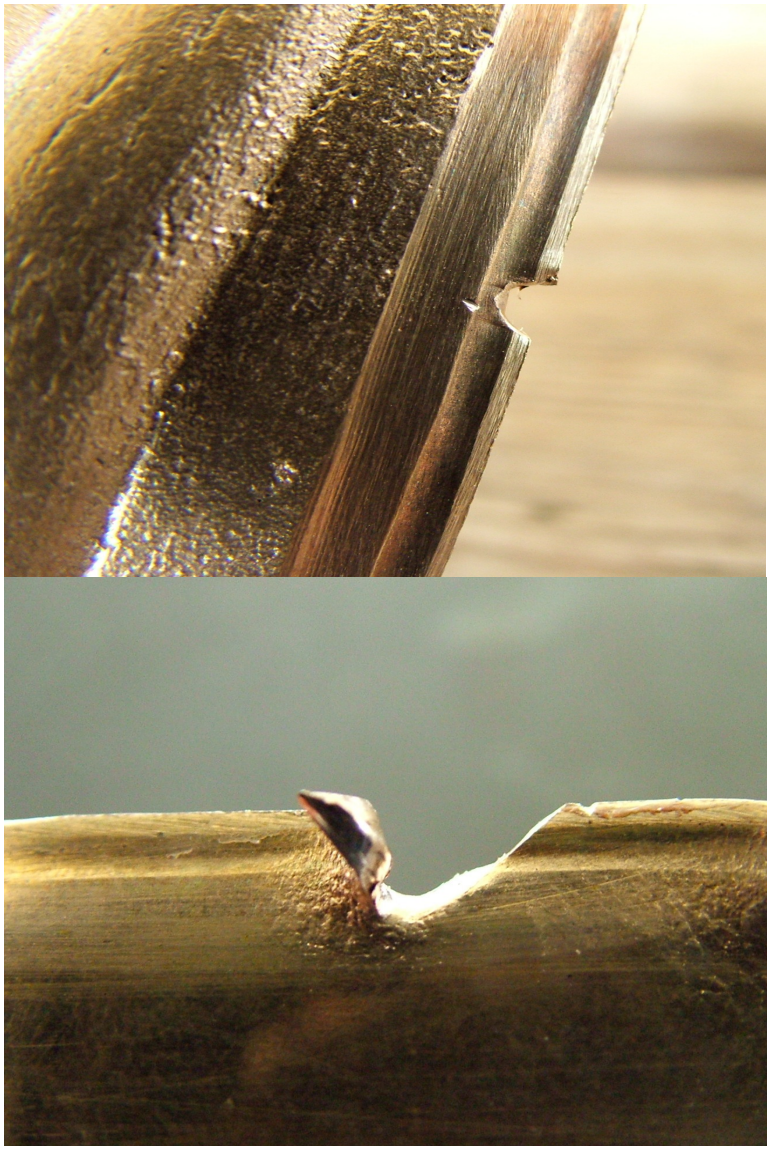

Figure 35: Comparative damage to experimental spear (top) and sword (bottom) from a single strike (S28, A2)

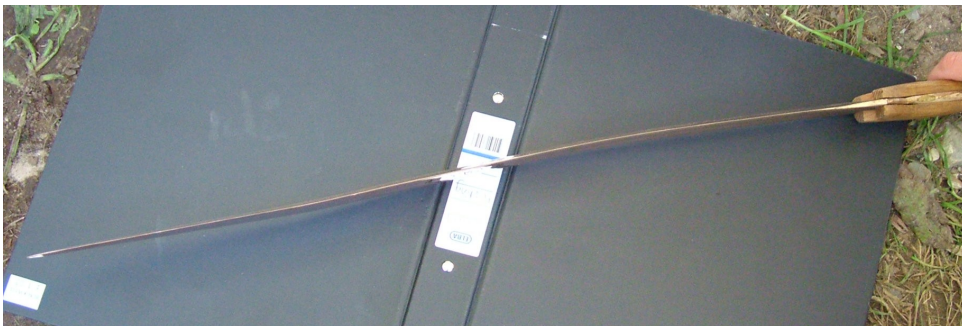

Figure 36: 'Double bending' damage on experimental sword

Figure 37: Locations of Vickers testing on experimental spearheads

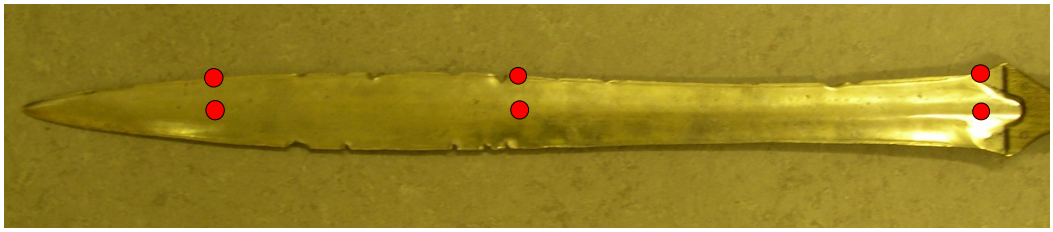

Figure 38: Locations of Vickers testing on experimental sword

Figure 39: Damage to the flat of the experimental sword

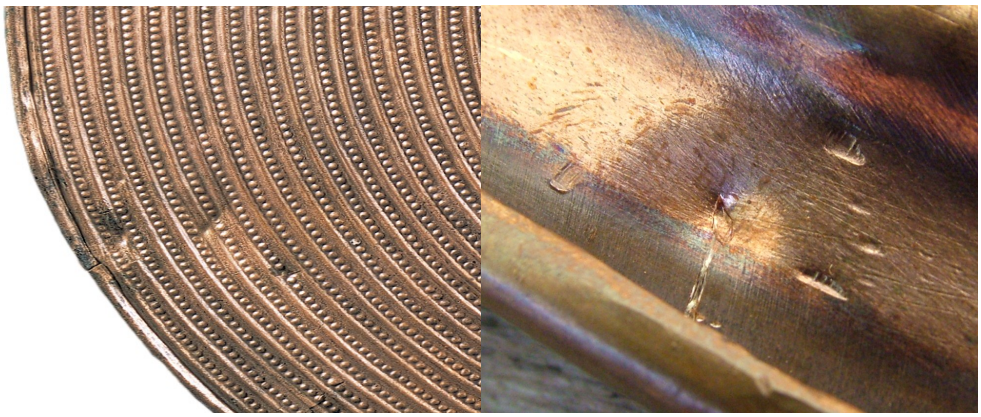

Figure 40: Damage to the Beith shield (left, copyright Society of Antiquaries of London) and the experimental shield (right)

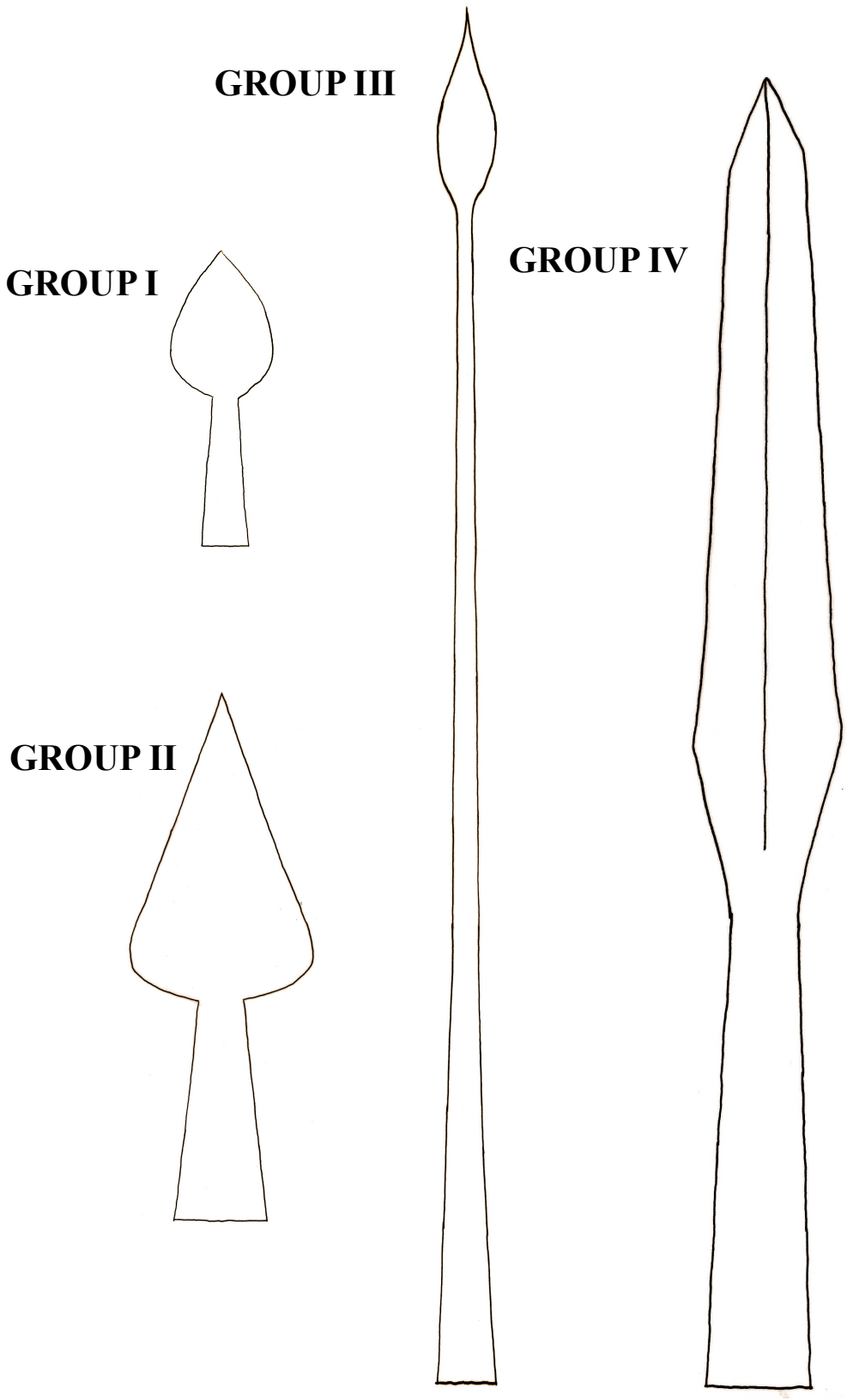

Figure 41: Groups I-IV iron spearheads

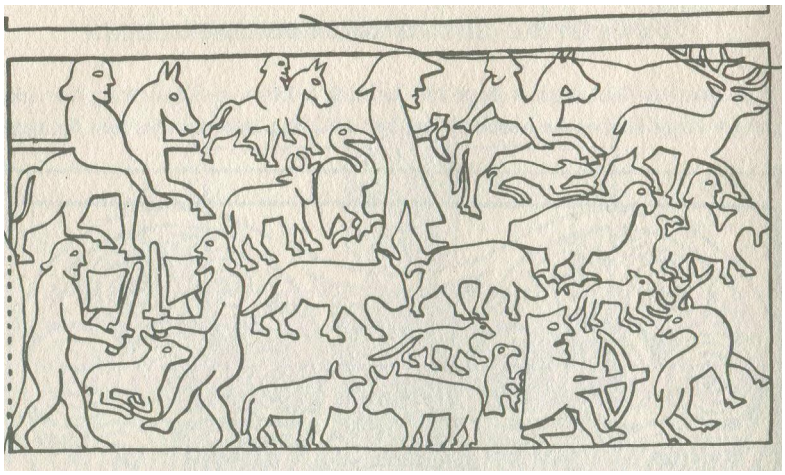

Figure 42: Shandwick stone (after Allen & Anderson, 1903)

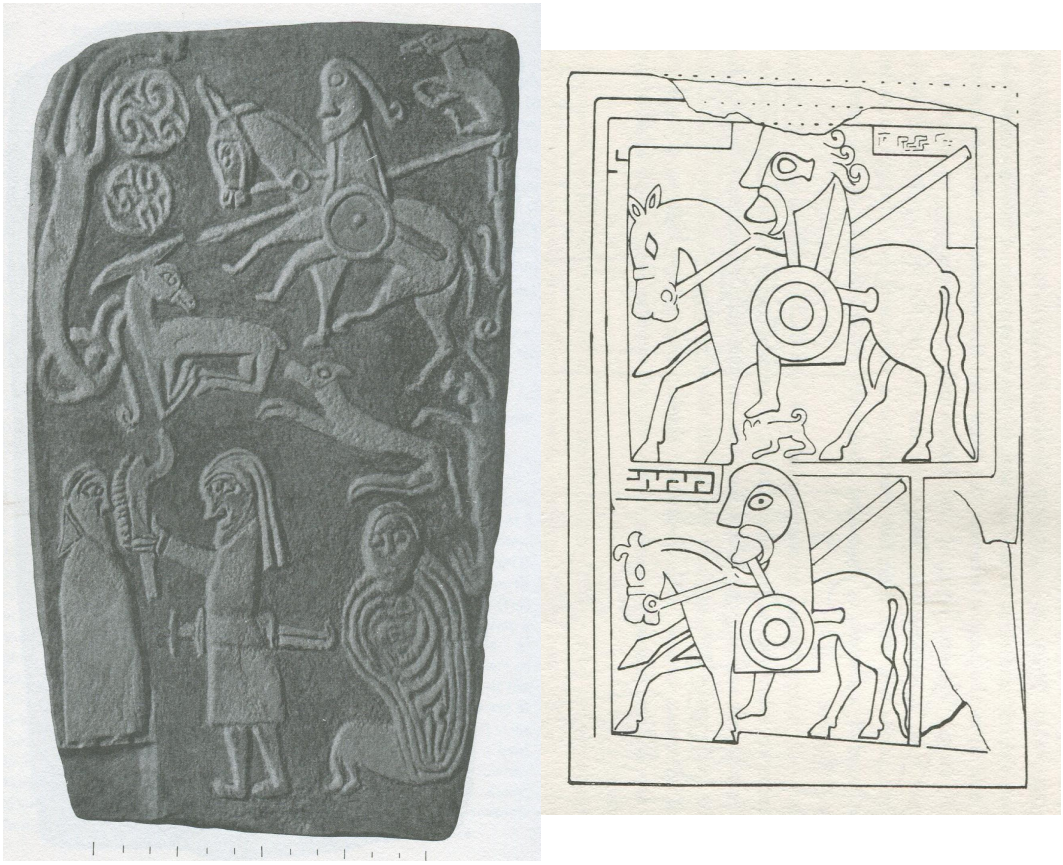

Figure 43: Inchbrayock 1 stone (left) and Benvie stone (right) (after Allen & Anderson, 1903)